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ORIGINAL ARTICLES

ETHYLENE

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ETHYLENE has now been in use for nearly two years as a general anesthetic. The time, therefore, seems ripe for a general review of the situation and an appraisal of its value.

HISTORY

The anesthetic value of ethylene was discovered at nearly the same time by Luckhardt and Carter[1] of Chicago and Brown[9] of Toronto. Luckhardt and Carter did their work in August, 1922[5], and Brown did his "late in 1922"[11]. Brown read his first paper before the Academy of Medicine, Toronto, February 20, 1923, and it was published in the *Canadian Medical Association Journal*, March 7, 1923. Luckhardt sent the title of a paper on ethylene to the secretary of the American Physiological Society in December, 1922, but for some reason it was not even put on the program[22]. The first paper of Luckhardt and Carter was published in the *Journal of the American Medical Association*, March 17, 1923. Brown, therefore, has clear priority of publication. His initial work, however, was not followed up in the thoroughgoing manner which characterized that of Luckhardt and Carter. This was very likely due to circumstances which were beyond his control. But the fact remains that the thorough follow-up and clinical work which Luckhardt and Carter initiated are mainly responsible for the present day use of ethylene.

Since its introduction, its use has rapidly extended, and it is now being used extensively in the United States, in France[33], and China[8], and probably other countries[7].

PHYSICAL PROPERTIES

Ethylene is an unsaturated hydrocarbon having the formula C_2H_4. It is a gas, at ordinary room temperature and pressure, with a somewhat ethereal smell faintly suggesting acetylene, to which it is closely related chemically. It is a solid below —169° C. and boils at about —103° C.[43]. It is "not very soluble in water, is more soluble in alcohol, but is soluble in ether"[27] and is freely soluble in oils[26]. As a gas it has a specific gravity of about .98[44]. Nitrous oxid is solid below —102° C. and boils at —90° C.[20]. A standard of purity of 98% for ethylene has been adopted[27]. Commercially it it dispensed compressed in steel cylinders.

The gas is inflammable, and when mixed with certain amounts of oxygen or air is highly explosive. Mixtures with oxygen must have a maximum of about 60% ethylene to be explosive, and the greatest violence of explosion comes with about 25% ethylene[12]. With air 5% to 10% ethylene is explosive[12]. Richer mixtures than these can be ignited, but do not explode. Leaner mixtures cannot be ignited, nor do they explode. A mixture of ethylene and oxygen, if subjected to high pressure such as occurs within the tanks, may explode spontaneously.

PHYSIOLOGICAL PROPERTIES

In the absence of asphyxia, the respiration is not affected[10], but with increasing doses there is depression of respiration with death finally, due to paralysis of respiration[11,21]. Poisonous doses are shown by slowing and failing respiration; but even marked depression is quickly relieved by the exhibition of oxygen[11, 21], though this cannot with safety be delayed till actual cessation of respiration[21]. In the absence of asphyxia there is practically no change in the pulse rate or blood pressure up to three-quarters of an hour[1] or an hour[11], though these are both quickly affected with the advent of asphyxia[3]. In some cases the heart continues to beat for five or six minutes after death from cessation of respiration[11]. Some observers feel that it forms a combination with haemoglobin, but the evidence is contradictory[3]. The clotting time of the blood is unaffected[36]. The liver[18] and kidneys[29, 34] are uninjured. There is general clinical agreement that the respiratory tract does not show irritation, and that there is much less sweating than with ether or nitrous oxid.

If no anoxemia is present there is a slight fall in the blood pH and carbon dioxid con-

tent, but it remains within normal limits after forty minutes' anesthesia. If anoxemia is present there is an initial alkalemia for fifteen or twenty minutes, followed by a sharp drop in pH and a tendency to uncompensated alkali deficit, just as there is with the anoxemia of nitrous oxid[14]. The blood sugar is increased less than with ether and about the same as with nitrous oxid, and returns practically to normal within twenty-four hours. The changes in the non-protein nitrogenous constituents of the blood are insignificant[37].

Analgesia is greater and lasts longer than with nitrous oxid[21]. In normal first stage labor under analgesia the contractions are slightly less than under nitrous oxid analgesia[17,24]. With anesthesia the contractions become further lessened and in the second stage they may be abruptly terminated by a rapidly produced deep anesthesia[17].

In short, ethylene is the purest anesthetic which we know today, in that for a given degree of anesthesia it produces less effect on the tissues and functions of the body than any other known anesthetic.

CLINICAL RESULTS

It has been frequently said that ethylene stands between ether and nitrous oxid. If this is so, it stands much nearer nitrous oxid than it does ether. The relaxation obtained, while greater than that obtained with nitrous oxid, cannot be compared with that of ether, and, in fact, is very far short of it. It also differs from ether in another very important respect, in that it is not nearly so safe in overdosage. Gwathmey, speaking of his work on animals, says[21]: "If respiration ceased entirely before the attempt at resuscitation, the result was always in doubt and rarely successful." And again[22]: "Ethylene cannot be *pushed*, as the usual danger signals are not apparent." Ether can be given in overdosage with comparative impunity as far as concerns immediate danger to life. But from clinical experience I fully agree with Gwathmey that, as far as danger in overdosage goes, ethylene is very much more dangerous, and in this respect compares more nearly with nitrous oxid.

As compared with nitrous oxid, ethylene has two disadvantages: its smell and its inflammability. The smell is of minor importance. It can be covered up with other more pleasant odors; or the induction can be started with nitrous oxid. The inflammability will be considered a little later.

Except for these two features it has all the good qualities of nitrous oxid and, in addition, has the advantages of being more powerful and a better relaxant. Thus its use entails little if any of the anoxemia which in some degree accompanies every nitrous oxid anesthesia and is the bane of this anesthetic.

Among a considerable number of clinical observers,* there is very general agreement on the following points:—Ethylene may be used with more oxygen than is possible with nitrous oxid. There is better relaxation, though not as good as with ether. There is much less sweating than with either nitrous oxid or ether; there are fewer gas pains; and the general post-operative condition of the patient is better. It has no irritative or other harmful effects on the lungs, kidneys, or liver. Most of these observers agree that ethylene is preëminently an anesthetic for bad risks. This is one of its oustanding features.

There is some disagreement about the amount of vomiting. Unquestionably this varies with the purity of the gas. The first gas which was put out commercially produced more vomiting than either nitrous oxid or ether. The present gas produces much less than ether, and probably not far from the same amount as nitrous oxid,—sometimes more and sometimes less, depending on the particular lot of ethylene. If the gas is really pure and is given without anoxemia, it seems probable that the vomiting will be less than with nitrous oxid.

USES

Its field of usefulness is very large. No absolute contraindication to its use has been found except the presence of sources of ignition. "It has been employed successfully and without deleterious effects not only as an anesthetic agent in all types of general surgery on otherwise healthy subjects, but also in cachectic infants as well as in the aged with marked pulmonary cardiac, vascular, and renal pathologic conditions."[4] It appears better than nitrous oxid in exodontia[28] and an extremely favorable report on its use in gynecology and obstetrics has recently appeared[24]. Opinions differ somewhat as to its value in first stage labor but agree on its value in the second stage[24,17]. The fact that it gives fair relaxation and that, after its use, the child cries readily, appears to give it a very definite place in all types of obstetrical operations. The lack of sweating under its use is of value in serious operations, as body fluids and heat are thus conserved. In respiratory infections this same feature helps by preventing chilling of the body surface. The field of its greatest usefulness, where I believe it stands today without a peer among general anesthetics, is in operations on handicapped and "bad risk" patients.

In this clinic we began to use ethylene in November, 1924, in some of the most hazardous cases, such as thyro-cardiacs with auricular fibrillation, patients with acute abdominal conditions who also had respiratory infection, and individuals in unusually poor condition from prostatic obstruction, and we have been so

*See bibliography. This bibliography is reasonably full but is not complete.

pleased with the results that we have gradually extended its use to those less seriously ill.

At present we are using ethylene with all thyroid patients who are not evidently in good condition and with practically all other patients whose condition is not satisfactory where deep relaxation is not essential, and even in abdominal operations when the patient is in poor condition or has respiratory infection.

From the small series which we have so far done,* it seems to us probable that, with toxic thyroid patients, ethylene possesses a distinct advantage over nitrous oxid, in that it seems to produce less increase in blood pressure and pulse rate during anesthesia. In abdominal operations a small amount of ether added is a great help. Ethylene is also excellent to use where the patient must be up in stirrups. In the few cases of exodontia in which we have used it, we have found it distinctly superior to nitrous oxid. We believe, however, that ether, because of its superior relaxation, is still the anesthetic of choice in abdominal operations on subjects in good condition, and we still continue to give nitrous oxid to our thyroid cases who are in unquesionably good condition, because it lacks the fire hazard of ethylene, and because it has already carried us with great satisfaction through a long series of similar cases.

MANAGEMENT OF ANESTHESIA

The administration of ethylene is very similar to that of nitrous oxid and is comparatively easy for those who are already skilled in the use of the earlier gas. The main points to be emphasized are:—

1. The percentage of oxygen may be higher, usually about fifty per cent. or more higher than with nitrous oxid. The color of these patients is sometimes spoken of as an "unnatural pink." suggesting a combination with haemoglobin, though, as was stated earlier, no such combination has yet been shown to exist.

2. The patient may be run somewhat lighter. This is due to the fact that its analgesic properties are decidedly greater than are those of nitrous oxid. Thus under ethylene a patient may be pink and have an active lid reflex and still make no movement at the beginning of operation, as so often happens under nitrous oxid even though he is slightly cyanosed and snoring.

3. More care should be used not to overdose the patient, especially during induction. This is a distinct personal impression which I have received from clinical experience, and which I have not seen mentioned by other observers, although Gwathmey does say[22] that this gas must not be pushed, and several observers have mentioned pallor under its use.

4. The eye signs very closely parallel those under nitrous oxid.

5. The breathing is somewhat slower and less vigorous.

6. Ethylene freezes in the valves of the apparatus much more readily than the present anhydrous nitrous oxid, so that some sort of heating device is usually necessary. This must *not* be a lamp, but may be an electric heater or hot water bag.

7. Last, but not least, it is inflammable. This brings us to the subject of precautions.

PRECAUTIONS

One of the most important features of ethylene, and its only really serious drawback, is its inflammability, and its explosibility when mixed in certain proportions with oxygen or air. The mixtures usually used in anesthesia are inflammable but are too rich to explode. For short periods, and in some cases perhaps continuously, they may be weak enough to be explosive. The mixtures ordinarily used may catch fire more easily than ether because they remain inflammable at a greater distance from the mask. The ether mixture is near the lower limit of explosibility[12]. Consequently it takes very little dilution with air to weaken it beyond the point at which it will ignite. Moreover, ether vapor is about two and one-half times heavier than air and tends to drop to the floor out of the way. The ethylene mixture is too rich to explode. Therefore, as it drifts away from the mask and is diluted with air, it becomes explosive at a distance where ether would perhaps have become too weak to ignite, and then this explosive mixture has to be diluted still further before it will be too weak to ignite. Consequently it seems probable that it will catch fire at a greater distance from the mask than will ether. Moreover, it is of almost the same weight as air and so may drift in any direction. It has been ignited at distances of several feet[32,34].

There seems no danger that a room could get so full of ethylene that its contents would form an explosive mixture and the whole room be exploded *en masse*. Calculations have shown that it would take about six hours of ordinary administration in a room 12 x 15 x 15 feet, with no ventilation, to form an explosive mixture[12].

All possible sources of ignition should be kept out of the operating room. There is a wide variety of such sources, chiefly the cautery and sparking electrical apparatus such as fulguration apparatus, X-Ray, or ventilating fans. Electric currents, particularly of high amperage, such as those used with heaters, should not be switched off. If they *must* be switched off care should be taken to see that any possible drift of ethylene toward them is broken by making a current of air across the drift.

The most elusive form of ignition is the static spark. That the danger from this source is by

*Total number of cases is now 85, of which number 43 are thyroid cases.

no means imaginary is shown by several recorded instances[25], [45].* Ethylene gas flowing over insulating material such as rubber, so commonly used in the leads from gas machines, may form a static charge. One may be formed by the motions of a breathing bag and especially by the motion of the bag against an enclosing fabric mesh[39].

To guard against these various sources, insulating material should be avoided, and machine, table, patient, and anesthetist should be grounded together. The rubber leads from the machine should be replaced by metal, or at the least a wire, preferably spiral, should be run down the inside of the rubber tube, especially in the larger tubes. For the small tubes the flexible metal tubes used for gas appliances are excellent. The machine, table, and patient may be bonded together by copper wire. The anesthetist should then take hold of some part of this group before turning on the ethylene and so ground himself to the same potential. Metal masks should be used instead of celluloid, as, in the event of the ethylene catching fire, it seems probable that the patient may receive a worse burn from the explosion of the celluloid than from the ethylene[32].

The breathing bag is the most difficult part of the apparatus to take care of. Fortunately, the inside is probably kept sufficiently moist by the patient's breath, so that static charges will leak off before their potential becomes too great, especially where the bag is next the patient. If one wishes to be particularly careful, and especially if the breathing bag is at some distance from the patient, a fine chain may be run through the bag[39].

Ethylene tanks should never be attached to any apparatus which has been used with oxygen, nor should oxygen tanks be attached to any apparatus which has been used with ethylene, as explosion may occur when the high tank pressure is turned on. In fact, reducing valves for ethylene are made with a left hand thread, which fits the left hand thread on the large ethylene tanks, and makes it impossible to attach these valves either to oxygen or nitrous oxide cylinders.

Explosion of ethylene within the tank itself seems altogether unlikely, as these tanks are shipped freely by the manufacturers, and in the recorded instances where the gas has been ignited during administration, no trouble has been experienced with the tanks. The storage of extra tanks should receive attention. A leaky tank in a small, ill-ventilated room might form an explosive mixture. A safety valve might conceivably blow, with the sudden release of a large quantity of ethylene. The extra supply should, therefore, be stored in a room shut off from the rest of the hospital, but freely ventilated to the outside.

*We have just learned that at the Presbyterian Hospital in Chicago, where ethylene was given its first clinical trials, two explosions have occurred, and that on this account its use has been discontinued for the balance of the cold weather, when static electricity is most abundant, or until some more efficient grounding or other device for the prevention of static spark has been devised.

SUMMARY AND CONCLUSIONS

Ethylene is the purest anesthetic which we have today in that for a given depth of anesthesia it produces less effect on the body than any other known anesthetic. It can be used with a considerably higher mixture of oxygen than can nitrous oxid and it gives better relaxation. But it does not give relaxation which can compare with that of ether and therefore it cannot replace ether for abdominal surgery with subjects who are in good condition. Its one serious drawback is its inflammability; and this should be carefully guarded against. It is preeminently the anesthetic for the handicapped and "bad risks" patients. It is undoubtedly the best general anesthetic which we know today for such patients.

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MULTILOCULAR PAPILLARY CYSTS

BY KENDALL EMERSON, M. D., WORCESTER, MASS.

For the New England Surgical Society, Hartford, Conn., September 26, 1924.

In a recent article on carcinoma of the colon, an eminent Boston surgeon has clearly stated the principle that prompts me to report the case which forms the basis of this paper. In speaking of advanced and seemingly hopeless cancer, he says, "The only way the surgeon can get any comfort out of these cases and the only way any progress can be made is to make up one's mind to operate on any case which one thinks he can make more comfortable by so doing. I believe that even a mortality of 25% should not deter one from proceeding with the radical operation."

Fortunately our increasing attitude of apprehension toward all tumors, even those admittedly benign, is bound very gradually to reduce the number of advanced cases of malignancy on which the surgeon is called to operate. Yet the apparently hopeless case will probably be with us for many decades to come. It is the occasional striking success in such operations that encourages us to lead the next forlorn hope in reasonable disregard of our mortality record.

Multilocular cysts of the ovary are sharply divided histologically into simple and papillary, according to the arrangement of their lining epithelium. The fact that occasionally a small patch of papillary growth is found on the wall of an otherwise simple cyst leads to a clinical suspicion that too sharp a line of demarcation cannot be drawn between the two classes. This discussion concerns itself, however, only with the frank papillary type.

Because they do not usually spread by metastases through the lymphatic system, papillary cystadenomata are not definitely classed as carcinoma. In fact they are not rarely referred to as benign tumors, at least in their early stages. Mallory says, however, "These epithelial tumors of the ovary vary from benign to malignant. To draw a sharp line of division is impossible. The papillary adenocystoma is always to be regarded with more suspicion (especially if its cells are ciliated) than the simple adenocystoma. If the epithelial cells form a single orderly arranged layer and are multiplying so slowly that no mitotic figures can be found, the tumor may be looked upon as benign; but if the cells tend to pile up into two or more layers, and cell proliferation is rapid, the tumor should be regarded as carcinoma." Furthermore he states that while apparently all gradations occur between the certainly benign simple and the potentially malignant papillary cyst, the presence of ciliated cells in some of the latter suggests a possible difference in origin of the epithelial cells. Dellafield and Prudden are even more positive. They say, "Clinically serous cystadenoma (papillary cystadenoma) is malignant. Recurrence occurs on 75% of the cases; ascites is the rule; secondary peritoneal implantations are frequent and are less apt to disappear after removal of the ovarian tumor. On the other hand in some cases even after incomplete removal of the growth, permanent cure results." Without further laboring the point it is surely safe for the surgeon to regard as malignant a tumor so uniformly lethal in its end result if left to itself to work its will on an unfortunate host.

The following case illustrates the truth of the last statement and offers an encouraging instance of operation for malignant disease, performed almost in extremis, with a most happy outcome:

Case Report:—Mrs. J., housewife, seven children, three miscarriages, came to me in March, 1923, complaining of very rapidly increasing abdominal distension during the past few months. This had been accompanied by severe headache, anorexia with nausea and vomiting of late, oedema of the ankles, great shortness of breath and severe attacks of pain radiating from the epigastric region. Constipation had

become most obstinate and frequency of micturition was a constant symptom. Recently an unproductive but very persistent cough had developed.

Physical Examination revealed an enormous woman weighing between two hundred and fifty and three hundred pounds. Her color was cyanotic, she was propped up in bed, breathing with difficulty, coughing rather frequently and with the anxious expression of an acute abdominal condition. The lungs showed passive congestion. The abdomen was tense and greatly distended, with an umbilical hernia the size of a grape fruit and but partially reducible. Through the umbilical ring, which admitted the whole hand, a large multilocular tumor could be palpated apparently filling pelvis and posterior abdomen and extending on the right side as high as the liver. There was abundant free fluid in the abdomen; the ankles showed very marked oedema extending well up the legs. There was a low grade phlebitis of the saphenous vein in the left thigh. The heart action was not good and the danger of an operation was explained. The patient elected to run the risk as her condition was intolerable.

Operation was performed two days later on March 28th, 1923. The patient took her ether unexpectedly well. A rapid dissection of the large hernial sac was made and it was found to contain partially adherent omentum and bowel. On opening the peritoneum, a large quantity of clear deep red fluid escaped and breathing became noticeably easier. When the incision was enlarged, the tumor was thoroughly explored. It filled the pelvis full and two huge cysts occupied the whole posterior part of the abdominal cavity. Anteriorly a mass of greatly thickened and nodular omentum was firmly adherent to the tumor. Coils of small intestine were also adherent and gave the impression that the tumor had engulfed them in its growth. The adhesions were so firm to the pelvic peritoneum that separation could be accomplished only by extensive peritoneal stripping, which was deemed far too dangerous to undertake. Separation of the coils of adherent small intestine appeared equally impossible. The nodular mass of omentum was separated and removed and the belly closed without drainage.

It was not expected that the patient would survive the shock of operation. She did unexpectedly well, however, and after the first few stormy days rallied quickly. In two weeks there was apparently some reaccumulation of fluid and before she was discharged one attempt was made to tap the belly. Only 34 ounces of blood stained fluid were recovered, evidently the contents of a cyst. She left the hospital on April 15th, eighteen days after operation, with the prognosis that she had only a few weeks to live.

The pathological report on the specimen of omentum was as follows:—"Connective tissue, many blood vessels, collection of cells with suggestion of papillary formation, atypical epithelial cells, a few seen in mitosis. Diagnosis:—Adenocarcinoma."

Subsequent history:—Contrary to expectation, the patient did not proceed to die. She was distinctly more comfortable for a few weeks but in June the dyspnoea again returned to a distressing extent. The patient re-entered the hospital July 5th, 1923, three months after the first operation with the demand that we operate again even though it was explained that such a course would be almost certainly fatal. The general condition was about as before the first operation, save that the hernia had remained cured.

Operation July 5th, 1923:—Ether was again administered in spite of a condition of practical orthopnoea and she again took it surprisingly well. A long lower median incision was made and the tumors immediately presented together with a certain amount of the characteristic reddish fluid. A large trocar was introduced successively into several of the cysts and more than five litres of dark red fluid drawn off. To our amazement, the adhesions so evident at the previous operation had largely disappeared. The omentum was pushed well up in the abdomen and not adherent. Very little difficulty was encountered in separating the small bowel from the cysts and unimportant denudation of peritoneal surfaces resulted. The pelvic condition was even more surprising for instead of finding practically no demarcation between cyst and peritoneum, the tumor could be shelled out with the tearing of only a few bands of stringy adhesions. A well defined pedicle was isolated, tied off and the cysts removed en masse close to the cornu of the uterus. The latter organ was sutured to the recti muscles and the abdomen closed.

Pathological report:—"Cysts, some filled with soft large cauliflower like masses, others with soft friable tumor tissue. Loose stroma with atypical epithelial cells often in gland formation. Many cells seen in mitosis. Diagnosis:—Multilocular Papillary Adenocystoma. Adenocarcinoma."

The patient made a most satisfactory recovery and left the hospital well in three weeks. Up to the present time, September, 1924, there has been absolutely no sign of return of the disease. She re-entered the hospital last fall for an excision of the area of phlebitis of the left thigh as it impeded her walking. She has maintained her weight, gained strength and been able to do much of the work about the house, hampered however by her extreme adiposity and a chronic arthritis from which she suffered long before the tumor appeared.

From the fact of the unqualified diagnosis of adenocarcinoma there can be little hope that the present satisfactory condition will long persist; but that the operation paid from the point

of view of prolongation of life and relief of suffering, there is no possible doubt.

There are two striking points about the case worth noting. The first is the extraordinary disappearance of adhesions between the time of the first and second operations. It might well be suspected that they were more apparent than real when first examined. In answer I can only say that attempts to separate them proved their firmness. The only theory of their disappearance that I can see is that the relief of intra-abdominal tension after the first operation was sufficient to enable resumption of peristaltic action on the part of well-nigh paralyzed bowel with the subsequent resolution of many of the adhesions.

The second question concerns the fate of the adenocarcinoma found already implanted in the omentum at the time of the original operation. It seems impossible that in the casual removal of the grossly infected portion of thickened omentum I could have removed all of the affected tissue. Probably the correct answer is that it is still there slowly recovering from the rough treatment it received at the two operations and soon to manifest itself again. This does not lessen the value of the fifteen months respite from the disease and the temporary relief of suffering that had become unendurable.

Finally let me repeat that with our refinement of technic in combating surgical shock and with increased speed and accuracy in operation, we should be slow to pronounce a case of advanced malignant disease inoperable; and that, until the riddle of cancer is finally solved, we should continue to deem it our duty not only to preserve life, but to fight for its prolongation, when that end can be accomplished with comfort and satisfaction to our patients.

Discussion

Dr. Walter Seelye, Worcester: We have just listened to a most interesting paper presenting an extraordinary case, on a subject familiar to us all. The pathological riddle of papillary cysts has long baffled our judgment. The apparent inconsisteney between laboratory reports and the amazingly favorable outcome of certain cases has rendered our prognoses most uncertain.

A papillary cyst of the ovary is a growth, the nature of which is on the border line of malignaney. In some instances it develops into definite carcinoma, while in others it remains benign, as is shown by some patients remaining indefinitely well after known foci of papillary growths have been left in the abdomen. It is also observed by eminent pathologists that portions of the growth in one case may show that it has changed over into carcinoma, while other portions of the same case will remain benign. It is claimed, therefore, that if certain portions of the mass removed show benign papilloma, it does not necessarily follow that certain unremoved foci may not be carcinoma, and vice versa, certain pieces removed may show carcinoma while patches of papilloma may be left and proved benign by the continued health of the patient.

The first impression when the abdomen is opened, is that the pelvis is filled with a cancerous mass, which cannot be removed and will soon cause death. But the pathological picture of malignancy is uncertain, the piece examined and pronounced adeno-carcinoma may not be a true criterion of the whole, hence the advisability of as thorough extirpation as possible, even though more than one operation may be indicated. This point was well illustrated in Dr. Emerson's case. As it is generally agreed that the growth under consideration is usually sooner or later bilateral, a removal of the other ovary also is usually advised.

This spontaneous retrogression of metastases has been observed by many writers, and is described with anatomical details by Froschel, Bumm, Freund, Fraenkel, Pfannenstiel and others. Olshausen says it is probable that regression of tumor fragments disseminated by operation occur very frequently, even sometimes without the removal of the primary tumor. According to Ewing there are several factors which seem to combine in this result. Chief among them is the low vitality of the transported cells which tend to atrophy. A chronic inflammatory process usually incloses the nodule in fibrin, granulation tissue, or multiplying endothelium, which cuts off the nutrition of the tumor cells. The nodule becomes flat and fibrous and finally disappears leaving a slight scar. A constitutional element is probably also at work, but the mechanism of destruction is largely cellular. This theory, I think, throws some light in explanation of the partial retrogression in Dr. Emerson's case, which took place between the first and second operations thereby making the second operation possible and successful.

Dr. Lyman Allen, Burlington, Vt.: These large ovarian cysts, I think, must be comparatively rare today. Even up in the wilds of northern Vermont the large ovarian cyst isn't frequently seen. The papillary variety seems microscopically and occasionally clinically to be malignant, and at other times, clinically at least, non-malignant. I don't think it is impossible that the condition should be considered as a precancerous rather than an actually cancerous condition, because in true cancer, as we all know, the usual result of imperfect or incomplete operation is the rapid increase in the rate of growth of the cancer so that an incomplete operation in cancer usually is worse than no operation at all. This is not true in the papillary cystic adenoma of the ovary. It may be that the condition is similar to the fibrocystic adenoma of the breast which is precancerous

and certainly—I think I may say "certainly"—has a much better prognosis than frank cancer of the breast and is followed by better results after operation. The same is true here in the ovary.

I can remember now but two of these cases that were frankly malignant that I have seen within the past ten years perhaps. One of them I saw at a clinic at the Massachusetts General Hospital where the cyst had broken, and the mass of frog spawn looking material had spread throughout the entire abdominal cavity. I do not know the outcome of the case, but I know the patient was sewed up with a gloomy prognosis. The other case I saw last year, a woman who had had three previous operations and reported with an enormously distended abdomen filled with these masses of frog spawn appearing tissue. Some of that was removed. It was impossible to get it all out; and the woman lived for several months.

The treatment, of course, as for any other precancerous as well as cancerous condition, should be early removal and as complete removal as possible; but surely in our prognosis we should remember that these cases do surprisingly well, if we must accept the pathologist's diagnosis of cancer in all cases.

Dr. F. B. Lund, Boston: This is an interesting subject in which a large number of our members must have had experience, and I will throw the paper open for general discussion with the hope that the members will tell us what experience they have had with this kind of cancer.

Dr. Stephen Rushmore, Boston: I have been very much interested in Dr. Emerson's paper. The tumors described constitute a peculiar kind. The tumors of the ovary are multiform. The ovary can produce any kind of tumor, and such growths vary greatly in their clinical characteristics. There we have to deal with a tumor which sometimes looks as though it were malignant, is malignant according to the pathologist's report, and undergoes spontaneous cure. There can be no question or disputing the fact that some of these cases of papillomatous ovarian cysts with metastases undergo spontaneous cure. You can take out the original tumor and a few metastases and leave hundreds, and the patient is found to be well at a second operation when it is found that the metastases have disappeared.

Most of us do not like to accept the probability of spontaneous cure of cancer. If anyone talks of spontaneous cure, we say he is probably mistaken as to his facts. But we find a few cases where spontaneous cure of cancer takes place. In carcinoma of the cervix, if anyone claims a spontaneous cure, we have great hesitation in accepting that as a fact. We have in chorion epithelioma a condition where spontaneous cure takes place more frequently, and we have no idea why it does. Metastases have been detected in the lung, areas of consolidation, and the patient spontaneously gets well. Now we have to deal with conditions about which we know little, and the factors which go into this peculiar quality we do not know. The pathologist says it is malignant because metastases are found invading other tissues, and we have to deal with the peritoneum which is a peculiar structure, but if we get invasion beyond the peritoneum and metastases to other parts of the body from papillary ovarian cysts cure does not result. But if the invasion is of the peritoneum only, we may hope for a cure though generally we do not get it even in this peculiar condition.

There was one conclusion of the author of the paper which I would like to accept with modifications; and that is if I understood him he optimism with reference to the partial removal of carcinoma. In cancer of the cervix there can be no optimism, I would say. His conclusion is more general than I think we ought to accept. Partial removal of these carcinomata of the ovary of the papillomatous type may be followed by cure, and incomplete removal of chorion epithelioma of the uterus or vagina or cervix may be followed by cure. I would not like to accept the statement that a partial removal of carcinoma of the rectum may be followed by cure or a partial removal of cancer of the breast. But in papillomata of the ovary with peculiar tumors, border line tumors. Why one tumor proves fatal and another does not we cannot say. There are involved conditions of nutrition, cell resistance, and cell digestion of which after all we know little.

Dr. David Cheever, Boston: I would like to add testimony as to the clinical course of these tumors. I think we have a few under treatment at our Clinic in Boston, whose clinical course is similar to that of the case described by Dr. Emerson and which after operation were subjected to massive deep irradiation, and we have attributed the failure to die to that irradiation; but from Dr. Emerson's case and what Dr. Rushmore said, probably that isn't so.

It is interesting to speculate as to the action of the peritoneum in destroying these cells. Certainly a malignant cell which is freed and becomes implanted on the peritoneal surface cannot have as much probability of permanent viability as a cell which is transported by a lymphatic or blood vessel and lodges in the tissues; and we know the bactericidal action of the peritoneum; and it seems possible besides the physical conditions which are hostile to growth in the peritoneum that there may be some cellular destruction there also; and I should like to supplement the caution which Dr. Rushmore states in reasoning from this that a partial removal of carcinoma in other places is wise. He has spoken of carcinoma of

the cervix and breast and rectum, and I need only say that carcinoma of the buccal mucous membrane is another case in point where partial removal is apt to be disastrous. But the moral from this type of case is that this type of lesion should be courageously and thoroughly attacked.

Dr. W. H. Bradford, Portland: I have had experience with two cases of this sort in the past year and a half. I would like to report one of them as being quite unique and particularly interesting. I think a year and a half ago I was called over to New Brunswick to operate on a woman whose abdomen had been rapidly increasing in size and who had her abdomen opened and a tumor removed. Her abdomen had been increasing in size and she was getting pressure symptoms, and with a provisional diagnosis in mind I didn't say much about it but thought of papillary cystic adenoma. I opened her abdomen and came down upon a mass of gelatinous rubber like material which was transparent and not surrounded by any capsule—free in the abdominal cavity, and I put my hand down through that mass and felt a tumor mass in the pelvis, and with a great deal of difficulty because this gelatinous material would slip off my gloved hand, I succeeded in removing most of that material and then removed a sizable mass from the pelvis springing from the left ovary, which later proved to be a papillary cyst adenoma. The great omentum, I should say, was completely involved in a process of numerous small cysts so that the omentum in the portion I saw was as thick as the palm of my hand. I didn't attempt to remove the omentum, and I know I made an incomplete removal of the tumor which was attached in the left ovarian region because in separating it from the broad ligament I know I cut its attachement and sewed through the mass. The patient a few weeks later was operated upon after I sent my report to the doctor in charge who thought a more complete operation could be done, and they did another operation—the local doctor did—from which she didn't recover.

Dr. John M. Gile, Hanover, N. H.: On the basis of my own clinical experience, I should be obliged to disagree with some of the opinions in the discussions of Dr. Emerson's paper.

I have in the last twenty-five years operated on a large number of these malignant ovarian cysts, and in all cases where the process had already penetrated the cyst wall and become attached to other abdominal organs there has been recurrence of the malignancy. On the other hand, where the malignancy has been confined to the inner wall of the cyst and complete removal has been possible the cases have made permanent recovery. In other words, like other forms of malignancy, the patient has been cured if the malignant growth was completely removed, and if not, it has progressed in the usual manner.

I am speaking merely of the clinical results in my own experience.

Dr. D. F. Jones, Boston: I agree with Drs. Rushmore and Seelye that partial removal of carcinoma should not be undertaken if they mean by that actual cutting through the growth. If, on the other hand, they mean that removal of carcinoma should not be undertaken when there are glands or metastases which cannot be removed, I cannot agree.

I believe that any carcinoma should be removed when we believe it will give comfort to the patient for even a few months. Removal of the large malignant cysts of the ovary, such as reported by Dr. Emerson, should be undertaken even though all visible growth cannot be removed, for this often gives relief for a long period. Removal of carcinoma of the stomach and intestines sholud be undertaken frequently even though metastatic glands are present. On the other hand, removal of carcinoma about the mouth which would leave the patient uncomfortable should not be undertaken unless there is a fair chance of complete removal of the growth and involved glands.

Dr. F. J. Cotton, Boston: The senior Dr. Cheever summed this up and said, "it used to be taught that any incomplete removal of a malignant growth short of complete proves to be fatal"; and this comes pretty close to that.

Dr. F. B. Lund, Boston: I would like to say a word, and that is that my experience corresponds with Dr. Gile's experience. I have never seen a case where the partial removal of a cancer which had broken through resulted in cure. I had a case which lived for eight years and finally died of the disease.

Dr. Rushmore called attention to the peculiar pathology of the tumor. I have just had a multilocular cyst in which the woman looked cancerous, but I removed the cysts and they were reported by Dr. Mallory to be embryomata taking on a cancerous character. That woman had a large number of glands up along the mesentery and the spine which condition, I suppose, makes the prognosis bad. I should like to have Dr. Emerson speak about that.

In regard to what Dr. Jones says—especially in regard to cancer of the rectum or intestines, six months of comfort where we have certainty against the discomfort of a few hours' work is worth while, and we ought to remember that.

Dr. Kendall Emerson, Worcester, (closing): The point that I was making in this paper was not one of cure of the condition as only fifteen months have elapsed, but to stress the importance in this particular case of operative procedure and to encourage the tackling of even pretty hopeless conditions whenever possible in-

stead of closing up a belly on the ground that nothing can be done. It would be a wild-cat theory to say that every case of hopeless cancer should have a radical operation and yet such instances as the one I have cited do tend to keep up our courage.

In regard to the partial removal of cancer, I should of course not go on record as advocating that it could hold out anything but a bad prognosis; yet there is one point that I would like to bring to your attention from the report of the Memorial Hospital in New York in which they speak of the removal of the breast alone in instances where glands are palpable in the axilla and subsequent irradiation of these glands with cure. This is mentioned as a possibility with the use of that great ally of ours in combatting cancer—radium.

In the case that I have reported, deep X-ray therapy was suggested after operation. The patient lived out of town and could not undertake it and the radiographer didn't advise it. It is interesting to note that this case has done as well as that of Dr. Cheever where deep X-ray treatment was used.

Dr. Allen said that we did not see the large cysts today as frequently as formerly. It would be interesting to take a long series of ovarian cysts in 1900 and another series in 1924 and investigate the percentage of multilocular papillary cysts in the two series. If we found that the percentage of papillary cysts was much lower in the 1924 series, it would be fair to assume that simple cysts do develop into papillary if left alone, since today cysts are removed when small in size instead of being allowed to grow for a long time before removal as they were twenty-five years ago. I am convinced from my experience at the local hospital that we see papillary cysts less often. During the past two years there have been thirty-nine cases of ovarian cysts operated on at Worcester Memorial Hospital. Of this group, only two were multilocular papillary cysts.

Please do not understand that I am a proponent of the partial removal of cancer if it is possible to get it all out, yet I would still plead that where partial operation will prolong life and comfort, we should consider this as part of our duty.

ORIGINAL ARTICLES

THERAPEUTIC USES OF PARATHYROID GLAND

BY WILLIAM N. BERKELEY, A. B., B. PH., M.D., NEW YORK

A FEW notes on the structure and function of the parathyroid glands will be helpful to an understanding of their therapeutic uses.

The parathyroid glands in man are as a rule four in number. Each is about as large as a grain of Indian corn. Sometimes two, three, or five are found. I once noted six. The glands are not reniform, but generally flattened like a melon seed, or ovoid, or even spherical. They are softer than lymph-nodes of the same size, reddish or brownish in color, and have a thin fibrous capsule with characteristic venous tracery. Four glands will weigh 35 or 40 mg.. —sometimes more if very fatty. They lie in the neck, usually two on a side, one above and one below the middle of the rear edge of the thyroid lobe of the same side. They may even fit into notches on the posterior border of the larger gland. The upper left gland is often deeper than its fellows, lying against the spine at the posterior border of the gullet. One or more glands are said to be sometimes two inches below the thyroid, or even embedded in its substance. In 130 autopsies in which the parathyroids were removed I never noticed such positions[1].

The *fine structure* of the parathyroids throws no special light on their specific functions. The cells lie in solid anastomosing columns suggesting the arrangement in the cortex of the adrenals, or the anterior part of the pituitary gland. H. Bergstrand[2] has given a very elaborate recent account of the histology. Pathological changes are mostly chemical and circulatory, and are not recognized very readily with the microscope. No one who has studied less than fifty normal glands knows much about any pathological condition, for there is a wide range of non-pathological variation. There are many valves in the small veins in and around the glands. There is of course no duct, but there may be a few pockets lined with epithelium, and containing an eosinophil "colloid."

In the dog and cat the parathyroids are usually minute flattened oval masses embedded in or under the thyroid capsule. In rabbits there is normally one gland free on each side of the neck, and one gland embedded deeply in the substance of the thyroid toward the lower posterior border.

When less than all the parathyroids are removed surgically from the dog or rabbit or other convenient animal, nothing happens. When all are removed, the animal sickens in from 12 to 36 hours, refusing food, and beginning to tremble and shiver more and more violently. Rabbits have also very generally drooled freely in my experience. The muscular movements may be only fibrillary, affecting all the voluntary muscles, or there may be intercurrent general convulsions. Young rabbits die very quickly. Old dogs may live two

or three weeks. Occasionally recovery takes place after a day or a few days, this being presumably due to physiological hypertrophy of some accessory gland or surviving remnant of normal gland. The classic train of symptoms is briefly called "parathyroid tetany."

The *chemistry of the parathyroids* has been much disputed. W. G. MacCallum[3] was able temporarily to arrest the post-operative tetany by intravenous injection of soluble calcium salts. Beebe and Berkeley[4] verified this experiment, but concluded from further laboratory work that calcium salts have only a drug effect, and that the glands secrete some substance,—possibly an enzyme,—facilitating the intermediary metabolism of nitrogen. The latter view has been largely confirmed by the work of Paton, Findlay, and others[5], who found in the urine and blood of subject animals a toxic congener of creatin, namely *guanidin*, or *methyl guanidin*. By injecting suitable amounts of guanidin into normal controls they were able to produce a series of symptoms strikingly similar to parathyroid tetany.

H. C. W. Vines[6] has recently offered some interesting and original evidence that the parathyroids are concerned *both* in calcium metabolism *and* in guanidin detoxication. This part of the subject awaits further investigation.

Passing to the *clinical aspect* of the subject, the practitioners of bedside medicine have not been slow to suggest a large variety of convulsive diseases as being connected with deficient or abnormal secretion of these glands. Epilepsy and puerperal convulsions were among the first. No one, I believe, any longer adheres seriously to these proposals. Tetany in man was suggested by Jeandelise[7] and later by MacCallum. Parkinson's disease was brought forward by Lundborg[8] of Stockholm in 1904, and by the writer independently[9] in 1905.

Vines (l. c.) claims that among non-convulsive diseases many chronic suppurative processes (specially varicose ulcers) in which the calcium content of the blood is reduced, will heal promptly when parathyroid is administered.

In surgery we must further note the occurrence of parathyroid tetany as a grave accident following thyroidectomy when the parathyroids or their blood supply have been damaged during the operation. The administration of parathyroid may save a life now and then under these circumstances, if there have been any gland remnants left behind which are capable of hypertrophy within a short time after the operation.

Finally, there are some cases of convulsions in the newborn infant which are possibly due not to injury of the brain, but to compression of the parathyroids or damage to their blood supply during parturition.

Up to the present time these are the only diseases rationally to be associated with deficiency of the parathyroids. The connection, either synergic or antagonistic, of the parathyroids with the thyroid is mostly speculative. The connection of the parathyroids with the immunity mechanism of the animal body is entirely speculative. Many market preparations of parathyroid being entirely inert, the scattered reports through the literature of wonderful cures of every possible disease from arthritis deformans to paroxysmal tachycardia by "parathyroid" are not to be taken seriously. The *vis medicatrix naturae* was always there, or other remedies were used at the same time, or the diagnosis was not assured, or the observer was prejudiced, or the patient's imagination was the secret of success.

Passing to the actual use of the remedy at the bed-side the physician must first of all be sure that he is using a standardized preparation. Much of the material in the market is valueless. There are, however, several dealers in New York who make a good parathyroid,—both tablets and hypodermic,—standardized by the method I have elsewhere suggested[10], namely the effect of a given amount of extract in a given time on the tetany of a parathyroidectomized rabbit of given weight. The dose of this extract, either by mouth or under the skin, is 1/50th grain.

In *tetany of all descriptions*,—the tetany of gastric dilatation, of pregnancy, of rickets, in the endemic tetany of European cities,—parathyroid is a rational and efficient remedy. In *post-natal convulsions of infants* large hypodermic doses should be tried.—in the hope that the convulsions may not be due to brain injury. In *post-operative tetany* hypodermic use of parathyroid should not be delayed.

I doubt, however, whether parathyroid will be in great demand in America for the ordinary non-surgical forms of tetany. These disorders are rare with us, generally mild, often self-limited, and they yield readily as a rule to symptomatic remedies, to intravenous injections of calcium salts, and to antispasmodics.

Of the possible value of parathyroid in *chronic suppurative processes*, specially *varicose ulcers*, we have already spoken. Vines (l. c.) has reported 13 out of 15 cases of varicose ulcer as improved. To his own cases he gave commercial parathyroid of unstated origin standardized by an ingenious original process. He incubated for four days a measured amount of parathyroid with guanidine. He then titrated as guanidine picrate the amount of guanidine remaining, thus determining as he thinks the amount of guanidine detoxicated by the parathyroid. The exact composition of his parathyroid is in doubt, as he seems to say in another place (l. c., p. 77) that he was unable to arrest parathyroid tetany in animals with any of his material.

The great service of properly standardized parathyroid to therapeutics is in the *treatment*

of paralysis agitans. Since the writer introduced the gland in 1906 as a remedy for this disease, the clinical "tryout" has been successful in from 60 to 70% of the hundreds of patients who have given it a fair trial. Even where positive effects have not been marked, it seems in many ways to "peg" the case, preventing for a long time a further aggravation of the symptoms.

Institutional cases have not done so well; the reasons require no amplification. But in private practice improvement is common, and now and then quite a miracle is performed. Moreover, these therapeutic miracles have been performed not by myself but by unprejudiced medical colleagues who had no personal equation to satisfy. For example, George Martyn[11] described a case in an elderly man, bed-ridden, helpless, and far advanced in the disease, who got up from bed, began to dress himself again, and took up once more the pruning of his orchard trees,—a joy he had long been a stranger to. The only period in which he relapsed was when a fresh supply of medicine was delayed in the mails, and he was without treatment. The father of a medical friend in New York was literally kept alive by my preparation for many years, and knew always from his own sensations whether the right amount of hypodermic had been given him, or whether too much saline had been added.

Improvement is usually slow. Satisfactory progress is generally noticed for a few months, and then the remedy should be continued in sufficient doses to maintain the *status quo.* To promise a "cure" is from the nature of the conditions not more reasonable than it would be in the case of cretinism or diabetes. But the treatment is easy, not very expensive, and carefully managed cases often get on very comfortably with the remedy for many years.

There are no contraindications, nor is there any chance as a rule of the patient's getting too much of the medicine. Once in a thousand times, perhaps, a patient is found who cannot take the preparation at all. I can only account for this as idiosyncrasy. Dr. Parcher, of Saugus, Mass., wrote me an interesting account of such a patient. After the very first dose she had curious symptoms of rigidity which were possibly hysterical, but, as I now remember the account, the same train of symptoms recurred when the tablet was given her later. Two other such cases I have heard of; but the occurrence is of extreme rarity. In any event no more than a certain amount of discomfort seems to be involved; there is no danger.

The effect of properly made parathyroid in paralysis agitans is not associated with the calcium content of the blood. A calcium-poor diet, a calcium-rich diet, doses of soluble calcium salts, either by the mouth or in the veins, have no effect that I have ever been able to observe. Considering the terror with which physicians have always regarded this dreadful disease, I think it no exaggeration to say that the parathyroid treatment, as I have described it, has wrought a distinct advance.

The dosage is tentative. Usually two or three tablets a day, after meals, and one hypodermic at bedtime are enough. Often the patient can get on very well on less than this. Sometimes he will require more. The hypodermic is entirely without reaction in the tissues. When pain and redness occur, the technique has been faulty. And finally, it must always be remembered when using internal secretions that the best method of administration is that which most perfectly imitates nature's own, namely, small and frequent doses continued through long periods of time.

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EPIDEMIC ENCEPHALITIS (HEMIPLEGIC FORM)

Report of a Case with Recovery*

BY MITCHELL BERNSTEIN, M. D., PHILADELPHIA

MANY clinical types of epidemic encephalitis (encephalitis lethargica) have been described since Von Economo's original description in May, 1917,[1] of a number of cases occurring in Vienna. The hemiplegic form of the disease is not frequently encountered, and in a statistical report of 864 cases of epidemic encephalitis collected by Wechsler,[2] there were but 18 cases (2.1%) of the hemiplegic form.

Buzzard and Greenfield[3] were the first to call attention to this form of the disease in 1919, reporting four cases, in three of which the diagnosis was confirmed by subsequent pathological examination.

McConnell[4] recorded two cases, one, a man aged 52 years, who developed a gradual hemi-

*From the Department of Medicine, Jefferson Medical College. Read before the Philadelphia Neurological Society, October 24, 1924.

plegia lasting one week, with recovery, and another in a woman aged 71 years, which proved fatal.

Few of the reported cases of the hemiplegic form of encephalitis recovered, the prognosis being considered unusually grave.

SYMPTOMATOLOGY

Aside from the hemiplegia which may occur at any time during the active stage of encephalitis, or following the subsidence of the acute symptoms of this disorder, any of the other manifestations of encephalitis may be present. Encephalitis may occur at any age. The onset may be insidious or abrupt and usually appears as a general infection, followed by nervous manifestations. Headaches and double vision are common. Paralysis of any cranial nerve may be encountered, but involvement of the third, fourth and sixth is more frequent. Lethargy, while occasionally absent, is present in the majority of cases, in which instance the patient can be easily aroused. Delirium is a common symptom. Unusual irritability of the patient frequently first attracts attention. Myoclonic movements of the various muscle groups may occur. Symptoms of meningeal involvement may be present. The reflexes are variable.

The cerebrospinal fluid is usually clear. The pressure is normal or slightly increased. The cell content is normal in about one-third of the cases, while in the remainder there is a pleocytosis averaging 20 to 30 cells per cubic millimeter, the lymphocytes predominating. The reducing bodies do not disappear, and the globulin may be normal or slightly increased.

PATHOLOGY

Symptoms indicative of lesions of the brain, particularly the gray matter of the basal ganglions and brain stem, are important features of the disease. Regarding the hemiplegic form Buzzard and Greenfield reported petechial hemorrhages in the subcortical portions of the brain. Vascular congestion, peri-vascular hemorrhages and massive hemorrhages may occur not only in the subcortical portions of the brain, but in the basal ganglions or in the peduncle, accounting for the hemiplegic symptoms.

DIAGNOSIS

The occurrence of hemiplegia, especially in patients over 35 years of age, where there is no direct evidence of cardio-vascular-renal disease, suggesting gross cerebral hemorrhage, but revealing evidence of a sub-acute infection, should raise the question of either epidemic encephalitis, brain abscess due to secondary infection or thrombosis, usually due to syphilis. The absence of any primary focus of infection tends to exclude brain abscess while the blood and cerebrospinal fluid Wassermann reactions may reveal the presence of syphilis. Cerebral embolism due to valvular disease of the heart, especially occurring in unsuspected cases of mitral stenosis, is to be differentiated by a careful physical examination of the heart together with a study of the past medical history. The absence of choked disk in the ophthalmoscopic examination is important in excluding the diagnosis of brain tumor. Regarding hysteria, the former history and absence of various stigmata are usually sufficient in excluding the disease. In Botulism, the history of exposure, the gastro-intestinal symptoms, and the presence of bacillus botulinus, are diagnostic.

The occurrence of hemiplegia in a patient during the course of a general infection associated with visual disturbances, pathological drowsiness, or periods of excitation, cranial nerve palsies, especially the 3d, 4th or 6th, together with negative findings in the blood, and cerebrospinal fluid, and where there is no direct evidence of cardio-vascular renal disease, should suggest the diagnosis of the hemiplegic form of epidemic encephalitis.

PROGNOSIS

In the few reported cases of this particular type of the disease, the termination has usually been fatal although recovery has been recorded by Hall, McConnell and others.

TREATMENT

The treatment is purely symptomatic. Sedatives are often required during the periods of excitation.

The following is a report of a non-fatal case recently encountered:

History—C. B., aged 36 years; an Italian housewife; previously perfectly healthy; mother of three children, complained on awakening on the morning of July 29, 1923, of severe headache, vomiting, fever and loss of vision. The patient lay in a stupor for six hours. On the day following the attack, the patient's vision was blurred, while the headache and fever continued. On the third day of the illness, active delirium occurred. She grew very noisy and repeatedly struck her head in an effort to get relief from the intolerable headache.

On examination the patient was found to be well nourished; the pupils were equal, dilated and responded sluggishly to light; accommodation could not be determined; the chest, heart and lungs were normal; the temperature was 101.2° F.; the pulse rate averaged 110 per minute and the blood pressure was 130 mm. systolic and 80 mm. diastolic; the abdomen was normal; the extremities were extended, the left leg presenting a positive Kernig's sign, together with an exaggerated knee jerk. Babinski's reflex and ankle clonus were not demonstrable. There was no sphincter involvement.

The fluid obtained by lumbar puncture on the fourth day of the illness was under increased pressure. Fehling's solution was reduced by it.

There was no increase in cells. No polynuclear leucocytes were present. There were no demonstrable bacteria. The Wassermann reaction was negative, as was the culture.

The illness continued unchanged for two weeks, following which there was an abatement of all symptoms for four days, except the continuance of blurred vision. During this short period the patient insisted on being up and about.

On the 18th day of the illness there was a return of headache and fever. The patient again became dull, drowsy and lethargic. She could be aroused easily but would quickly lapse into a stuporous state.

Three days later, on the 21st day of the illness, the patient's pulse decreased to 30 per minute; the systolic blood pressure rose to 160 mm. and diastolic 100 mm. Six hours later the pulse rate was 90 per minute. The patient became very noisy.

A second lumbar puncture was done on the 23d day of her illness and the cerebrospinal fluid was again found to be under pressure. Fehling's solution was reduced as before. There were now 20 cells per cubic millimeter. No tubercle bacilli were found.

The ophthalmological examination at this time revealed an optic neuritis, together with a chronic chorio-retinitis. Vision in the right eye was 10/200 while that in the left eye was 8/200.

On the 24th day of the disease a palsy of the right side of the face was noted, together with a palsy of the right leg. The following day the right arm became involved together with the loss of speech. Sensation was absent in the right side of the face and leg. Both knee jerks were diminished. The biceps and triceps reflexes were absent in the right arm. The sphincters were not involved. There were alternating periods of restlessness and stupor.

Twelve days later (37th day of illness) there was a return of motion in the right arm and leg to a slight degree. The knee jerks were now spastic, and ankle clonus and Babinski's reflex were demonstrated in the right leg. The first evidence of return of speech occurred although it was quite indistinct.

Four days later movement of the right arm and leg improved. The facial palsy was greatly lessened. Kernig's sign, which had been a constant finding in the left leg, was absent for the first time.

On the 54th day of the illness (30 days after the hemiplegia) the facial palsy had almost entirely disappeared. The speech was greatly improved, although still somewhat indistinct. An area of anesthesia along the ulnar side of the right forearm anteriorly and posteriorly and in the little and ring finger was present. The right knee jerk was normal while the left was slightly exaggerated.

Eight months after the onset of the illness, the patient's only remaining difficulty was a slight slurring of certain words, together with a slight anesthesia of the ring and little fingers of the right hand. The altered mentality frequently observed as a sequel in this disorder was evidenced at this time by an attempted suicide, apparently provoked by the annoyance of the slurring of words.

No abnormality was noted in the urine. The blood and cerebrospinal Wassermann reactions were negative. Blood chemistry studies during the heighth of the disease revealed the non-protein nitrogen 25 mlg. per 100 c.c., urea 13 mlg. and creatinin 1.1 mlg. per 100 c.c.

The temperature rose to 101.4° F. during the first two weeks of the illness and was absent thereafter.

Summary—The patient, aged 36 years, previously in perfect health, presented evidence of an acute infectious disease with loss of vision; alternating periods of restlessness and stupor followed, after a subsidence of symptoms for 4 days, by a right sided hemiplegia, from which there was practically a complete recovery.

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STUDIES OF THE VITAMIN POTENCY OF COD LIVER OILS—XVI—THE VITAMIN A POTENCY OF SHAD BODY OIL

BY ARTHUR D. HOLMES

[Research Laboratories—The E. L. Patch Co.]

THE results of numerous investigations show that the liver oil of cod and of other members of the family Gadidae is the richest known source of fat-soluble vitamins. From this, it is quite obvious that cod livers are very valuable for human food. But, unfortunately, few except fishermen eat cod livers, whereas the so-called "edible portion" of the cod, hake, haddock, and pollock is a common food of large numbers of people. Little fat is derived from this source for, according to chemical analysis, the edible portion of cod fish contains less than 0.5% of oil.*

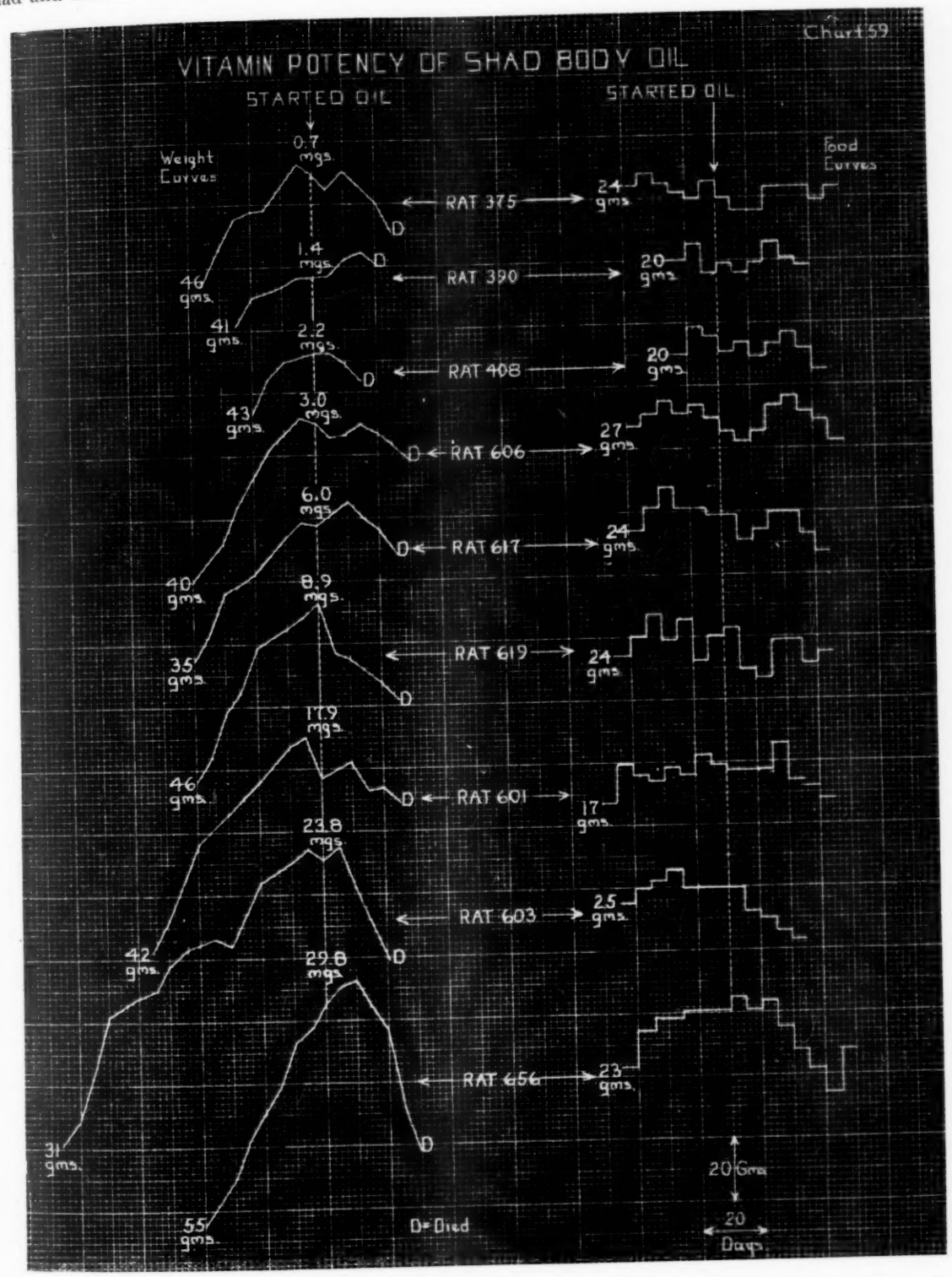
Contrasted with the tendency of cod, hake,

*U. S. Dept. Agri.—Office Experiment Stations Bul. No. 21, 1895.

haddock, and pollock to store excess fat in the liver, the so-called "fat fishes" such as the shad and mackerel store excess fat in their muscle tissues. Analysis of the "edible portion" of shad showed it to contain as much as 9.5% of fat.*

Since both groups of fish have somewhat the same habitat and food supply, one very naturally questions whether body oil obtained from the "fat fishes" is at all comparable with the liver oils obtained from members of the family Gadidae as a source of the fat-soluble vitamins. It was to secure data in this connection that the present investigation was undertaken.

For the purpose of the experiments reported



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below, shad body oil was chosen as typical of the body oils from common food fishes rich in oil. The shad oil used in this study was supplied by the U. S. Bureau of Fisheries and was prepared in the Bureau Laboratories from Potomac river shad. The fish were dressed in the usual manner. The edible portion was cut in small pieces and boiled in water until the fat was released. The mixture of oil and water was filtered through cheese cloth and subsequently through laboratory filter paper to remove all suspended solids. After cooling, the oil was separated from the water. The shad body oil obtained in this manner would be properly classed as crude oil. It was of a light yellow color, with a rather high stearin content, for at room temperature about one-third the volume was a precipitate of stearin.

The oil was analyzed in the usual manner to determine its characteristics. These were found to be as follows:

Sp. Gr. at 25°C	Ref. Index at 30°C	Sapon. Value	Iodine Number	Acid Value
0.9203	1.4702	188.3	134.4	0.5336

The refractive index and iodine number of the shad oil are somewhat lower than those for average crude cod liver oil. The color and general appearance of the shad body oil was similar to that of cod liver oil obtained from strictly fresh livers by the steam process.

The vitamin potency of the shad body oil was determined by the method commonly employed in this laboratory[1]. In brief, this consists of feeding recently weaned albino rats a diet consisting of purified casein 18%, peanut oil 22%, corn starch 28%, lactose 28%, and salt mixture 4%, until their body reserve of vitamin A had been exhausted. When the experimental animals develop the characteristic symptoms associated with this type of malnutrition their previous diet is supplemented with a known quantity of the oil under investigation. By giving a different quantity of oil to the different animals, information is secured concerning the amount of oil required to supply sufficient vitamin A to meet the experimental animals' needs for recovery.

The accompanying chart gives in detail the results that were obtained in the tests of the potency of shad oil. It will be noted that from 0.7 to 29.8 milligrams of shad oil were fed daily to animals suffering from malnutrition caused by a diet inadequate as regards vitamin A.

All the experimental animals used in these tests of the vitamin potency of shad body oil failed to recover from malnutrition. In general, all failed during the entire period that they were receiving the shad oil and none lived for more than thirty days. Numerous tests of the vitamin potency of domestic cod liver oil show that one milligram or less of cod liver oil prepared from fresh livers contained sufficient vitamin A to cause rapid recovery in animals in a physical condition similar to those used in the tests reported here. From this data it is very evident that shad body oil cannot be compared with cod liver oil as a source of vitamin A.

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TREATMENT OF SOME COMMON SKIN DISEASES OF THE FACE

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We find, both in private and at the hospital out-patient departments, so many patients seeking advice upon the above question, that we have felt urged briefly to discuss the matter.

In considering skin diseases of the face, it is only necessary to refer to treatment. Diagnosis presents no difficulty as a rule.

1. *Acne Vulgaris.*

A considerable amount has been written about this disease. An abundant literature has sprung up relative to its treatment with the Roentgen Rays. Even allowing for the natural enthusiasm each one has for his special method of treatment, it can truly be said that in the X-Ray we have at our disposal a means of curing Acne Vulgaris. Lotions and ointments will temporarily improve the face, but recurrence is the rule. Our patients ask for a permanent cure. It is a fact, of course, that Acne will clear up, in many cases, as the patient enters the third decade of life. This disappearance, however, leaves as its aftermath a face disfigured with pits and scars. This does not help any young lady's matrimonial opportunities. It is clear, therefore, that we cannot rest on our oars and counsel delay. It is only fair to the patient to give her the benefit of X-Ray treatment.

The details of dosage are unnecessary here. We invariably administer short exposures over a length of time, i. e. fractional dosage. There is not the slightest danger of a burn with this technique.

The ultra-violet rays have proved of no per-

manent value in our experience, but towards the closure of a course of X-Ray therapy, we generally give a few strong desquamative doses.

It seems to leave the skin soft and smooth. No ointments or lotions are used in conjunction with Roentgen therapy. They are contraindicated and unnecessary. Our patients are advised to be moderate in the consumption of carbohydrates.

2. *Basal Cell Epithelioma*

This fairly common disease is resistant to any but radical measures. Radium, X-Ray, Endothermy, CO_2 snow and surgery are means of dealing with the disease.

The following technique has given us excellent results. The affected area is cleansed and then sprayed with ethyl chloride. With a small sharp curette the diseased area is rapidly gouged out. Bleeding is controlled and the raw area then receives a double erythema dose of X-Ray. The wound is dressed with adhesive tape and the patient instructed not to tamper with the dressing. Healing progresses rapidly under the adhesive tape. In about three weeks a perfect scar results.

3. *Hypertrichosis.*

This disease is a calamity to many otherwise beautiful skins, but calamitous as it is, if very marked, we advise no interference. The multiplicity of small scars, and the time depilation would take, contraindicate treatment of an active nature. But as a rule, fortunately, the disease can be effectually cured with the electric needle. The cosmetic result is good, and our patients are satisfied. It requires time and patience and the qualified physician is the only one who should be entrusted with its administration.

We do not advise the X-Rays in this disease. Any dose that will effectually and permanently depilate the hair, will bequeath a legacy of atrophy and telangiectasis.

4. *Nævus Pigmentosus.*

We employ and recommend for the eradication of these blemishes the electric needle. The cosmetic result is excellent. CO_2 snow, surgery and monopolar endothermy will achieve excellent results also, but we have reserved their use only for the larger growths. The needle is not painful as a rule, and it is our method of choice.

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Towards middle age, the faces of some people have a tendency to become erythematous particularly over the malar bones, and on the nose. With this redness there is commonly more or less marked telangiectasis and pustulation. Successful treatment depends upon the readiness of the patient to curtail his diet, for there is generally some co-existent gastro-intestinal complaint. For the erythema a lotion is prescribed. Lotio Alba is about the best obtainable. It is advisable to prescribe it in small bottles and rapidly increase the strength of the zinc sulphate and sulphuretted potash.

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In a previous paper, we urged the Roentgenization of Eczema of the face. The result of such therapy is astoundingly rapid. A good ointment, if compounded by a skilful chemist and applied constantly, will frequently obtain the same result. But how many working people can afford to take time to do this properly. That is what militates against success. Moreover we find cases of chronic eczema which will resist the most skilful treatment with ointments or lotions, and which will rapidly clear under Roentgen therapy. It is a fact that the Roentgen Ray is employed almost exclusively by many dermatologists today for the treatment of chronic eczema of the face.

7. *Seborrhea.*

Fastidious members of the fair sex, the possessors of otherwise excellent complexions, at times call for advice about an annoying oiliness of the skin of the face. Much can be done for this abnormal condition with medicated steam sprays and astringent lotions. Should relief not follow, it is well to remember that the X-Ray, by its selective action on the epithelium lining the sebacious and sweat glands, will bring about the desired results. Dosage is low in this condition but the results are good.

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Aluminium Sulphate	Four grams.
Glycerine	fifty grams.
Ext. Violet	five minims.
Aq. Laurocerasi	ten grams.
Aq. Rosae	ten grams.

This lotion is allowed to remain on all night. Next morning apply cold cream with gentle massage and remove it when leaving the house. It is quite obvious that smoking, injudicious food and drink, and late hours will hasten the ruination of any skin.

9. *Keratosis Senilis.*

Elderly people are fairly frequently afflicted with small hyperkeratotic brownish or yellowish excrescences which are unsightly, occasionally precancerous, and easy to rectify. When the lesion is markedly stratified or of a horn-like nature, we advise its removal with the curette followed by an intensive X-Ray application. If the growth is not very marked, and if there are a great number of them we cauterize with trichloracetic acid and prescribe a salicylated cold cream.

10. *Chloasma.*

This yellowish or brownish macular pigmentation will resist mild measures. We believe that strong ultra violet ray application will improve the condition, but invariably refer our patient to the gynaecologist or internist first.

There are other diseases that affect the skin of the face, but they are either so simple, e. g. Ringworm, and Impetigo contagiosa, as to need no comment, or so refractory, e. g. Lupus Erythematosus, as to call for a more extended treatise.

CONCLUSIONS

(1) This paper discusses some common cosmetic ailments of the face, briefly outlining treatment.

(2) No apology is made for the apparent simplicity of the diseases mentioned. Physicians and especially those specializing in cutaneous diseases are well aware of the necessity of a cure in these conditions. The question of cure is not a matter of life or death, but it is quite essential to give relief if one desires the everlasting gratitude of the patient.

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A REPORT OF 500 CONSECUTIVE TONSILLECTOMIES IN THEIR RELATION TO THE COAGULATION TIME OF THE BLOOD AND HEMORRHAGE

BY GEORGE L. RICHARDS, M.D., FALL RIVER, MASS.

Dr. Greenfield Sluder in his book, "Tonsillectomy," in the chapter entitled "Hospital and Preparations," says, "Tonsillectomy should not be considered such a minor operation as to make it seem trifling. It is very much more of a surgical procedure than many patients think or are led by their surgeons to think. It should be performed in a hospital where the internes are familiar with it and the subsequent course of such cases. The patient should remain in the hospital until he is in proper condition to leave. The blood should be clotted before operation. Subsequent bleeding is very much less when the blood clot is normal. A simple method of determining the clotting time is to place a drop on a glass slide at body temperature and determine when it begins to fibrinate. Normal blood makes fibrin in from three to five minutes. I have seen disaster follow the neglect of this precaution. From the wound made to get the drop for coagulation the estimate of vascular resiliency should be made. Should it bleed to an unusual degree, the operation should be postponed. Later it may have returned to normal. Should the clotting be too slow, calcium salts may bring it to normal. Should it remain persistently slower than five minutes, the operation should be postponed. Later it may have returned to normal. The clot should always be done at body temperature. If it be too cold, it may make three or four minutes' delay in the clotting time."

In accordance with this recommendation, the Trustees of the Union Hospital voted to require every case of tonsillectomy to have a coagulation test performed previous to the operation. As this is a hospital requirement it is done in all cases without charge to the individual whether that case be private or clinic.

From February 24th to July 8th, 1924, five hundred tonsil operations were performed. As the Union Hospital is an open hospital these operations were performed not only by the ear, nose and throat department but by various other physicians and by various methods. The ages ranged from less than one year to 56 years, there being two of this latter age.

No. of Cases	Age
25	Under 3 years
66	From 3 to 5 years
175	From 5 to 10 years
107	From 10 to 15 years
64	From 15 to 25 years
55	From 25 to 40 years
8	From 40 years and over

In these five hundred cases the coagulation time varied and was as follows:

No. of Cases	Coagulation Time
1	2 Minutes
80	3 Minutes
98	3½ Minutes
147	4 Minutes
51	4½ Minutes
84	5 Minutes
6	5½ Minutes
21	6 Minutes
4	6½ Minutes
4	7 Minutes
2	7½ Minutes
1	8 Minutes
1	8½ Minutes

Of the five hundred cases, there were only six hemorrhages or .012%:

Age	Operation	Coagulation Time	How Controlled
19	T & A	4 Minutes	Sutures
20	Tonsils	4 Minutes	Pressure & hemostatic serum
29	Tonsils	4½ Minutes	Pressure
11	T & A	3 Minutes	Sutures
12	T & A	4 Minutes	Sutures
7	T & A	3½ Minutes	Nasal Plug

In the seven-year-old case, although the tonsils and adenoids were both removed, the bleeding occurred from the adenoid.

These cases would seem to show that instances of hemorrhage in connection with tonsillectomy are much less than is usually supposed since these operations were performed by operators of varying experience and ability and by varying methods, and also in varying positions, some being done in the upright and some in the recumbent posture. For the most part suction is used in the operations done in this hospital. Hemorrhage here includes only those cases in which the hemorrhage was sufficient to give real annoyance either at the time of operation or afterwards.

As to the value of the coagulation test, it does not appear from these cases that a great deal of information as to the liability of hemorrhage is to be obtained from the coagulation test as in all of the six cases in which hemorrhage occurred the coagulation time was in no one instance greater than 4½ minutes and reference to the table shows that there were more than 100 cases in which the coagulation time at the time of the test was five minutes or greater. Nevertheless, we regard this as giving information to the doctor and putting him on guard in all cases in which the coagulation time is greater than five minutes.

The methods in use in taking the coagulation time are three. That recommended by Sluder, the one in which the time is taken by watching the blood drop under the microscope, and the one which we have used for the most part which consists of putting the blood in a minute capillary tube, breaking off a bit of the tube at intervals and noticing the moment at which the fibrin clot strings from one end of the broken tube to the end of the other broken tube. This last seems the most reliable as it is freest from all possible sources of error.

While there were no excessive coagulation times in this series, we have had it delayed up to fourteen minutes and have operated without danger in such cases provided there was no manifest cardiac or kidney trouble or marked increase in blood pressure. In case there should be any trouble of this kind, operation should be delayed until improvement. We regard the taking of the coagulation time as a worthwhile routine procedure.

The term hemorrhage as here used does not mean temporary bleeding at the time of operation if not requiring anything more than pressure or the temporary grasping of a vessel to control. When the immediate bleeding is at all troublesome I have found that grasping the bleeding area with a broad blade clamping forcep like the Pratt rectal forcep gives satisfactory control. If applied when the first tonsil is removed it is usually ready to be taken off when the enucleation of the second tonsil is finished, when it can be applied to this area if required.

By hemorrhage I have meant bleeding to such an extent as to require definite measures for its control either at the time of operation or afterwards.

MESENTERIC DEFECTS AS A CAUSE OF INTESTINAL OBSTRUCTION

BY GEORGE DAVID CUTLER, M.D., F.A.C.S., BOSTON

[From the Surgical Service of the Children's Hospital]

G. P., a girl nine years and three months old, was admitted to the Surgical Service at the Children's Hospital the night of October 12th, 1920, for the relief of an acute abdominal condition. There was a history of exposure to tuberculosis. She had had measles, whooping cough and mumps. She had been subject to frequent colds with bronchitis for several years and epistaxis several times recently. There was no recent exposure to acute exanthemata.

An attack, somewhat similar to, but less severe than the present, occurred six weeks ago when she was awakened at five o'clock in the morning by severe abdominal pain accompanied by vomiting. Once the vomitus was blood tinged. Her stools were normal. The pain

kept her in bed for a day, after which time she was well until the present illness, which began this morning, October 12th, 1920, about six o'clock when she was again awakened by severe abdominal pain in the epigastrium and vomited with severe retching. The pain continued all the morning and she vomited repeatedly; each time streaks of blood were noticed in the vomitus. Her bowels moved twice yesterday and an enema given this morning produced good results. The mother massaged the child's abdomen repeatedly but by three o'clock in the afternoon the abdomen became so tender that the child could not bear to have it touched. She was given a bismuth preparation for her vomiting and this evening was given one dose of paregoric. Her physician saw her this morning and again tonight when he made a diagnosis of acute appendicitis and sent her to the hospital.

The physical examination showed the patient to be a well developed and nourished child who appeared pale and exhausted. The head, eyes, ears, nose, mouth and throat were negative. The heart was normal except for rapid action. The lungs appeared normal except at the left apex where there was dulness and the breathing was broncho-vesicular in character. The breath sounds were exaggerated in the left lower back. No râles were heard. The abdomen was somewhat fuller in the right lower quadrant than the left. The entire abdomen was tender, more particularly so on the right over a mass which filled most of the lower quadrant.

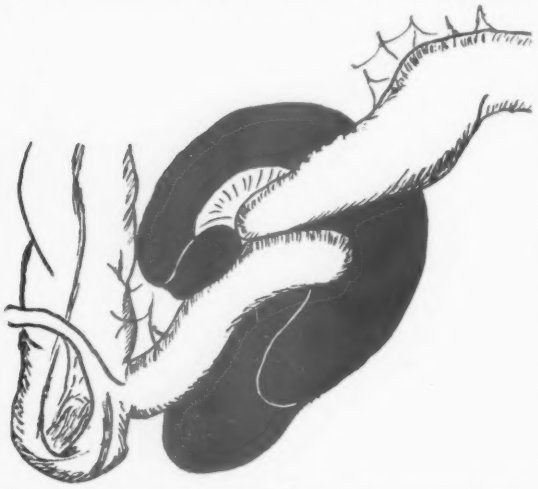

FIG. 1. Diagram showing relations of the obstructed intestinal loop.

There was a little dulness in both flanks but no definite costo-vertebral tenderness. A rectal examination showed the rectum to be empty. A rounded mass could be felt on the right side which was rather tender and palpation caused pain which was high up in the abdomen and back. The extremities and reflexes were normal. Her temperature was one hundred and eight-tenths degrees, pulse rate one hundred and forty-four, respirations twenty-four and the white blood count thirty-eight thousand. Differential:—polynuclears 94% and mononuclears 6%. The pre-operative diagnosis was acute appendicitis and immediate operation was advised and accepted.

Under ether relaxation a soft mass was felt under the left rectus. A four inch, low, right rectus muscle splitting incision was made. On opening the peritoneum blood-stained fluid escaped. A knot of gangrenous ileum was felt near a Meckel's diverticulum with a hole in the mesentery through which a loop of ileum had passed, becoming strangulated. Walling off gauzes were placed. About eighteen inches of the ileum, including the Meckel's diverticulum, was resected and a lateral anastomosis made. (Ileo-ileostomy about seven inches back from

FIG. 2. Showing the twisted effect of the loops.

the ilea-caecal valve.) A small cigarette wick was placed to the pelvis. The wound was closed in layers to the wick at its lower angle with number one chromic catgut to the fascia and silk-worm gut through and through and to the skin. The appendix was not removed. Immediate result:—The patient made an uneventful recovery from the operation and was discharged home in excellent condition, October 31st, 1920.

On November 8th, 1920, the patient was again seen in the Out-patient Department and examination showed the wound to be solidly healed and her general condition excellent.

This rare case stimulated my interest in this condition and a search through the records of the hospital revealed only one other history similar to it. A brief summary of the case follows:—A boy six years old was admitted September 19th, 1917. The family history was negative. He had had measles and whooping cough but no previous attacks of abdominal pain. He was taken ill at 4 P. M. the day before admission with abdominal cramps which caused him to draw up his legs. The pain was severe for two hours and then became somewhat less. He was unable to sleep because of pain in the lower abdomen. Vomiting began at midnight and was repeated frequently. There was no blood present in the vomitus, which consisted

mostly of food. The bowels moved on the morning of the day before entering the hospital, but not since that time. There had been no blood in the stools. Physical examination showed a well nourished child who appeared very sick and septic. The general examination was negative except for extremely rapid pulse (180), temperature one hundred and three and five-tenths degrees and respirations forty-eight. The abdomen, which was somewhat tender, showed marked non-shifting dulness in the right lower quadrant. There was general tenderness which was especially marked in the right lower quadrant. There was board-like rigidity across the lower abdomen. Nothing definite could be felt on account of the rigidity present. The

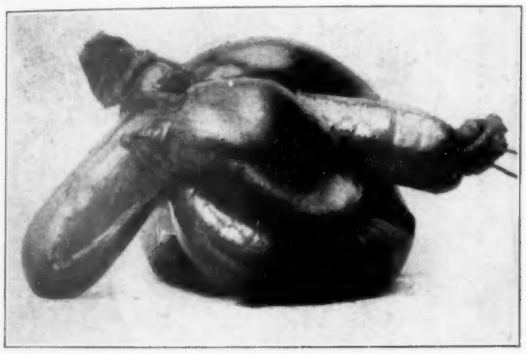

FIG. 3. Photograph of the specimen of resected intestine.

pre-operative diagnosis was ruptured appendix with peritonitis.

Operation—Dr. T. W. Harmer—"Child extremely toxic, practically moribund. Abdomen much distended. Right rectus incision, splitting muscle. Abdomen opened with the escape of considerable foul serous fluid. Loop of bowel present which is absolutely black; but mesentery was traced downward to its root, and it was seen that there was a small opening in the root of the mesentery through which the bowel had prolapsed. The bowel was gangrenous; it was impossible to manipulate it. Attempt was made to resect. Resection and end to end anastomosis completed. Child practically dead. Abdomen closed. Child died before leaving table." Examination of the specimen showed that three and one-half feet of the small intestine were gangrenous.

There is considerable literature concerning this type of intestinal obstruction, much of it in the form of case reports. Among foreign writers Hohlbaum's contribution is noteworthy. In this country H. P. Brown, Jr.[2] in 1920 reviewed the literature of the past twenty-five years, finding references to nineteen cases, and added that of a boy of five years on whom he had operated.

Referring to the older books I found the following statement made by W. W. Keen[3] in 1890:—"Sometimes as a result of traumatic forces a slit is torn in the mesentery or through the diaphragm of sufficient size to permit a knuckle of gut being forced in and constricted. This is an extremely rare condition and especially so before the age of ten years."

In this connection a case was cited, a report by Mr. Pye-Smith (*Lancet*, 1889 I, 472), concerning a boy of thirteen years who had suffered from an acute intestinal obstruction for four days. Laparotomy showed constricting band was Meckel's diverticulum attached at its extremity to mesentery. The diverticulum was a little over two inches in length. It came off from the bowel at almost a right angle between the mesenteric and free borders, then passed through an opening in the mesentery of the part of the bowel from which it sprang and completely encircled the bowel immediately above its origin. The constriction was not of a coil or knuckle but of a tube at one level only as if a cord had been tied around it at that spot. The bowels moved spontaneously in twelve hours after the constriction was relieved and a bit of fish-tin three-fourths of an inch long by one-fourth inch wide was passed. This had lodged above the constriction and precipitated the acute attack.

From the applied anatomy of F. Treves[4] the following statement is taken:—"Certain holes are sometimes found in the mesentery through which intestine has been strangulated. Some of these holes, especially those that are slit-like, are due to injury, others are due to congenital defect of the mesentery," and Davis[5] writes that "rarely openings are present in the mesentery which may allow strangulation in the coils of the intestine."

Hohlbaum[1] in a discussion of congenital defects in the mesentery causing intestinal obstruction, reports three cases of ileus caused by such defects. His paper was abstracted by Heller (*Int. Abstr. Surg.*, 31:372, 1920) from which the following information is derived. The defects were in the mesentery of the lowest portion of the ileum, near the ileo-cecal juncture being the most typical location. No satisfactory explanation for these defects has yet been discovered. Trauma, formerly placed foremost among the causes, is rare. The mesentery near the ileo-cecal juncture is frequently found lacking in fat and blood vessels and is often thin and free, and the fact that other anomalies in formation may be found indicates that the condition may be congenital.

Prutz believes the cause is inflammatory but as a rule no inflammation about the edges of the defective mesentery can be discovered.

In the first of Hohlbaum's cases adhesions were present in the vicinity of the defect and a calcified mesenteric lymph gland was lodged in the opening. While in this instance it could readily be assumed that the defect in the mesentery was of inflammatory origin, especially as the patient gave a history of tuberculous mesenteric adenitis, the fact that such defects do not

MESENTERIC DEFECTS AS A CAUSE OF INTESTINAL OBSTRUCTION.

No. Reported by	Sex	Age	History	Operation	Findings.	Pathology.	Result.	Remarks.
1. C. G. Franklin.[6]	M.	73	Intestinal Obstruction five days. Sudden abdominal pain. Vomiting became fecal two days before admission.	Opening enlarged. Reduction.	Coil of small intestine 6" long tightly strangulated in aperture of mesentery.	Bowel deep red, port-wine color and deeply indented by ring.	Recovery	
2. J. G. Smith.[7]	M.	12	Three weeks before pain and vomiting. Improved. Three days later had another attack	Reduction.	Bloody fluid in abd. Loop of strangulated intestine, very dark color through hole in mesentery.	Very dark colored strangulated loop bowel through hole in mesentery.	Recovery	
3. J.S.R. Smith.[8]	F.	15	Sudden abdominal pain & vomiting. Symptoms of intes. Obstruction followed, lasting until operation on fourth day.	Reduction.	Greatly congested loop of intestine in hole in mesentery 2½ by 2".	Congested loop of intestine through hole which had smooth thick margin. Congenital in type.	Recovery	No history of trauma.
4. J. Clark.[9]	F.	9	Sudden abdominal pain & vomiting. Fourteen hrs. later in state of collapse. Complete intestinal obstruction.	No operation.		Autopsy-30 oz. bloody fluid in abd. cavity. 4ft. lower ileum strangulated through aperture in mesentery. Evidence of old periton. in this area.	Death	4 yrs. previously had been run over by a trap.
5. A.P.C. Ashhurst.[10]	M.	12	Pt. fell and hurt hip, next day dietetic error. Abd. pain, vomiting & symptoms of intes. obst. for three days. Abd. distended, fecal vomiting, blood & mucus by bowel.	Resection 14 - 18" intestine. End to end anast. Drainage of pelvis	Fecal smelling blood fluid in abdomen. Black coil of gut in pelvis resembling volvulus.	Hole in mesentery; ileum passed through until stopped by base of Meckel's diverticulum.	Death 3 hrs. post-op.	Umbilicus suggested Meckel's diverticulum) Fell & hurt hip day before abdominal attack.
6. J. B. Deaver.[11]	-	-	Sudden severe pain while cranking car, rel'd in several days. Six mos. later while again cranking car severe pain, did not subside. Moribund on admission.	No operation.		Autopsy:-strangulated, gangrenous coil of intestine through a congenital hole in mesentery.	Death	Pain while cranking car twice - six month interval.
7. W. A. Lane.[12]	M.	10	Sudden, violent pain came on while asleep in central part of abd. Vomiting. Thoroughly purged by family physician. Two days later collapsed and became moribund.	Operation second day after onset.	Mass of dark bluish intestine 3½ ft. long passed through 7/8" hole in mesentery. Lower end was 2 ft. above ileo-cecal juncture.	Foul smelling bloody fluid gangr. loop 3½ ft. long through hold in mesentery 7/8", rough edges.	Death on op. table.	Attack came on while asleep. No history of previous attack or trauma.
8. L. J. Mitchell.[13]	M.	8	Second day after fall down stairs had severe abd. pain. Diag. by outside physician as peritonitis.	No operation.		Autopsy:-Opening in mesentery near ileo-cecal juncture. Sev. loops of strang. bowel through smooth margined hold in mesentery.	Death fourth day	Fell down stairs landing on abdomen; apparently unhurt. 2 days later abdominal symptoms.
9. A. B. Atherton.[14]	M.	14	P. I. began with dietetic indiscretion. Pt. was well purged with calomel. Seen second day after onset of symptoms of obstruction.	Removed a twisted Meckel's diverticulum, relieving obstruction.	Loop of ileum one foot long through hole in mesentery 6" from ileo-cecal juncture, not gangrenous and easily reduced. Post-mortem examination)		Death third day	Subject to attacks of abdominal cramps since 6 years old.
10. Mauclaire[15]	F.	21	Signs of complete intes. obstruction for five days. Mass palpated between umbilicus and pubis.	Operation. ? what was done.	Strangulation of 30 - 40 cm. of intestine through hole size of palm of hand in mesentery.	Margin of hold denoted it had been of long standing.	Death 10 hrs. post-operative	She fell some days before appearance of symptoms.
11. E. C. Staab.[16]	F.	30	Eleven days before adm. had severe abd. pain which lasted five days then ceased. Complete obstruction since first attack of pain. In state of collapse.	Reduction	Large intestine collapsed from cecum to sigmoid. On exposing small bowel, a portion slipped out of a circular hole in mesentery 5/8" in diameter 3" from ileo-cecal juncture. Blood supply good.	Autopsy:- nothing further found.	Death 8 hrs. post-operative	Always suffered with constipation. No history of abdominal injury.
			Pt. had severe abd. cramps which became more severe on way home. No wound of abd. Bullet 2" below and to the rt.		Loop of intestine imprisoned in a hole in mesentery.		Death 7th day post-operative 18th day	Man shot by companion while hunting. Part of charge entering thigh and
12. E. T. Castle.[17]	M.	Adult	& five 1/8 gr. s.c. In short time given dose of opium & in 15 min. he was quiet. Next day worse. Urine Oz. 2 obt. by catheter. No vomiting. Calomel oil Y enemas brought no results. 11 d. after onset oper.	Operation 11th day. Reduction.				fired threw up his hand and pitched forward on the ground.

			Pt. had severe abd. cramps which became more severe on way home. No wound of abd. Pain in below and to the rt.	Loop of intestine imprisoned in a hole in mesentery.			Death 7th day post-operative 13th day	Man shot by companion while hunting. Part of charge entering thigh and [illegible] fired threw up his hand and pitched forward on the ground.
12. F. W. Speidel.[17]	M.	Adult	& five 1/8 gr. s.c. In short time given dose of opium & in 15 min. he was quiet. Next day worse. Urine Oz. 2 obt. by catheter. No vomiting. Calomel oil Y enemas brought no results. 11 d. after onset oper.	Operation 11th day. Reduction.				
13. N. Macphatter.[18]	F.	73	Pt. complained of not feeling well & inability to move bowels. On 4th day showed symptoms of intes. obstruction.	Hole enlarged Reduction. Hold closed.	Loop of bowel through mesentery, twisted, not gangrenous.		Recovery	No history of trauma.
14. G.K.Dickenson.[19]	M.	45	Symptoms of acute obstruction of intestine.	Operation. ? what was done	General peritonitis. Hold in mesentery in region of cecum. Smooth margins 2" in diameter. A2# coil of intestine through the hole.		Not stated.	Author does not mention duration of condition, condition of bowel what was done, whether there was history of trauma or [illegible]
15. W. D. Hamaker.[20]	F.	72	Obstinate constipation for many years. Sudden onset of symptoms of intes. obst. Operation third day after onset of acute symptoms.	Removed Meckel's diverticulum and gangrenous omentum. Reduced hernia.	Meckel's diverticulum rolled up in one edge of gangr. omentum. Rent in upper part of mesentery through which passed all transverse colon & omentum. Opening size egg. Condition evidently of long standing.		Recovery.	
16. C. H. Frazier.[26]	M.	30	Symps. of acute int. obstr. Operation 3rd. day after onset	Reduction.	18" of congested small intestine protruding through a slit in the mesentery, easily reduced.	Slit probably of long standing.	Recovery.	Attack similar to P.I. 13 yrs ago. No history of trauma or dietetic indis.
17. J. B. Roberts.[22]	M.	19	Pain & other symps. of intes. obstr. No stool for 5 days. Abdominal distention.	Reduction.	In ileo-cecal region small intestine entangled in an opening in mesentery. Easily reduced. No gangrene. Orifice seemed congenital.	"There was apparently no actual protrusion of a loop through mesenteric opening, but the pent intes. gas thrust into opening so that sharp bend closed lumen.	Recovery.	Somewhat similar attack one year previously.
18. Glovanoff.[23]							Recovery.	Incarcer. intes. in aperture of vitello-intestinal duct.
19. Herczel.[24]							Recovery.	Intes. incarcer. with dble volvulus in mes. opening.
20. H.P. Brown, Jr.[2]	M.	5	Adm. 2 d. after fall. Pain in abd. & vomiting, continued next day. No stool. Rigid, distended abd. No mass. T- 101, P-140 R-46. WBC-21,000.	Op. 4th day Resection- end to end anast. with Murphy button Hole closed in layers.	1/2 liter blood tinged fluid. Knuckle gangr. gut 20 - 30 cm. presented a coil of lower ileum which had passed through a 3 cm. opening in mesentery & twisted on itself 2½ times Opening 5 cm. below cecum had rough edges appar. of recent origin.		Death 4 hrs. post-operative.	Fall down two steps striking dorso-lumbar region. Resumed play.
21. Pye-Smith.[3]	M.	13	Acute Intes. Obstruction for four days.	Constriction relieved.	Constricting band was Meckel's diverticulum attached to mes. passing through hole in mes. encirc. bowel.		Recovery.	Bowels moved spon. 12 hr. after constriction relv'd & piece of fish 3 1/4 by 1/4 in. was passed.
22. Darnall, W.E.[25]	F.	40	One mo. after hysterectomy had pain, vomiting & obstr. Op. 2nd day.	12" ileum. Resection & anast. with Murphy button dr.	Through an opening in mesentery of 2nd loop of ileum there had slipped a loop of 1st loop on lt. under spleen Volvulus of loop - gangr. & perfor.		Death 5 hrs. post-opera.	Pelvis normal.
23. Sohn,[26]								Adds another case to 52 on record with gap in mes. of sm. intestine.
24. Cutler, G. D.	F.	9-3/12	Severe abd. pain & vomiting 18 hrs. duration. T-100.8, P-144, R-24, WBC-38,000. P-94% M-6%.	Resection of ileum & Meckel's diverticulum. Lat. anastomosis.	Loop of gangrenous ileum through hole in mesentery.	Blood stained free fluid gangr. loop bowel 18" with Meckel's diverticulum.	Recovery	No history of trauma. Previous attack 6 wks before ? appendicitis with peritonitis.
25. Cutler, G. D.	M.	6	Pain in abd. & vomiting 24 hrs. duration. T-103.5, P-180, R-48. Tenderness & rigidity. Condition grave.	Resection. End to end anastomosis	Bowel gangrenous, loop through small hold in mesentery. Impossible to manipulate it. Resection & anastomosis.	Foul serous fluid. Black loop bowel through hole in mesentery.	Death(on table.)	No history of trauma or previous attacks. ? appendicitis with peritonitis.
26. 27. Hohlbaum. 28.			In one case history of tbc. mesenteric adenitis. In two cases severe strangulation with alarming symptoms & rapidly spreading gangrene.		In one case anomaly of sigmoid present. In another case volvulus of loop.			

occur after peritonitis renders it improbable that inflammation is an important factor in most cases. If it were, defective mesentery would be more frequent also after appendicitis. On the other hand, such inflammatory changes may result secondarily because of the defect.

In another of these cases, an anomaly was also found in the sigmoid flexure, which was adherent, displaced to the right and suspended from a short meso-sigmoid. This condition must have been of congenital origin, a view supported by the studies of Toldt and Konjetzny. The adhesions of the meso-sigmoid to the duodenojejunal flexure and the mesentery of the small intestine has been described by them as a developmental anomaly in the fetus. A shortening of the mesentery with stretching causes the formation of holes.

In two of the cases observed by Hohlbaum[1] there was severe strangulation with alarming symptoms and rapidly spreading gangrene. In one case the obstruction resulted from volvulus of the loop of bowel within the opening of the mesentery. To explain the volvulus he refers to the experiments of Payr on the causes of rotation of the intra-peritoneal organs.

Hohlbaum[1] says the diagnosis is difficult. In one instance the condition was diagnosed as appendicitis because of the location of the obstruction. At operation the character of the obstruction is very difficult to determine and the openings in the mesentery are not easily sutured; the omentum may be used to close these defects.

Keen[3] summarized the prominent points in recognizing acute obstruction from constriction of the bowel as follows:—

1. The history of injury, of peritonitis or of pelvic pain will usually be obtained.
2. The *pain* is very acute and continuous but with exacerbations.
3. There is prostration and collapse which may be extreme.
4. There is no abdominal tenderness or distention until very late.
5. *Vomiting* occurs from the very first and is frequent and copious and soon becomes fecal.
6. Constipation is absolute.
7. There is no tenesmus.
8. There is no tumor.
9. There is nothing to be felt on rectal examination.

He gives the prognosis as absolutely fatal unless relieved by laparotomy.

COMMENTS

As a matter of interest I have tabulated data concerning twenty-eight cases of mesenteric defect causing intestinal obstruction. Some of the information is fragmentary but taken as a whole it gives a fair survey of the condition. The first twenty abstracts have been taken from summaries of cases appearing in Brown's article.

From this tabulation the following information may be derived. The age of twenty-one of the twenty-eight patients is recorded. Six were from one to ten, six from eleven to twenty, two from twenty-one to thirty and three from thirty-one to forty years of age. One patient was between forty-one and fifty years of age. No cases occurred in the next two decades but three patients were from seventy-one to seventy-three years old, showing that the aged are not exempt. Most of the patients were less than forty years but twelve or more than half the number were under twenty years old.

Incidence according to sex shows that thirteen males and eight females were afflicted. In seven instances the sex was not given.

The history of trauma is mentioned in seven cases only. Previous attacks of abdominal pain were described in six instances. Pain and vomiting and other signs of obstruction were consistently present.

Of the known end results twelve patients died and eleven recovered, a mortality of over fifty per cent.

The duration of symptoms in the majority of the cases extended over a period of three to four days before operation.

As regards operations:—There were twelve reductions with ten recoveries and of five resections only one recovered. It is perhaps significant that an associated Meckel's diverticulum was encountered in four instances.

When the aperture was described it was usually located near the ileo-colic juncture and the size varied from five-eighths of an inch to three inches. The length of the strangulated loop of bowel passing through varied from a small knuckle up to four feet and in one instance the entire transverse colon and omentum had passed through an opening about one and one-half inches in diameter. Most of the apertures were circular, a few were slit-like and only one of them with rough edges was apparently of recent origin (Brown's case).

Bloody peritoneal fluid was present in many instances with various degrees of strangulation to gangrene noted.

In no case was the exact condition diagnosed before operation.

CONCLUSIONS

(1) A case of intestinal obstruction in a child from strangulation of a loop of ileum through a mesenteric defect with resection and recovery is reported.

(2) This is an unusual but not rare acute abdominal condition. It has not been recognized clinically from other forms of intestinal obstruction and several times because of associated fever, high pulse rate and leucocytosis has been diagnosed acute appendicitis.

(3) The apertures in the mesentery are probably in most instances of congenital origin,

rarely the result of trauma. It is doubtful if inflammation plays any part in their formation.

(4) The significance of severe abdominal pain and vomiting with other signs of obstruction should be recognized early and the appropriate treatment applied; namely, laparotomy and reduction as soon as the diagnosis can be made.

(5) This form of obstruction produces marked strangulation and gangrene supervenes rapidly. Early operation will increase the number of reductions and decrease the number of resections, thus lowering the mortality. In the severe cases with gangrenous intestine, a two stage operation; resection and drainage of the bowel first, then a later anastomosis is recommended.

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MISCELLANY

HOOKWORM RESURVEYS IN THE UNITED STATES

"During the years 1910 to 1915, hookworm campaigns were conducted in eleven southern states—Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, Kentucky. Special investigation was made of the infection rate among rural school children between the ages of 6 and 18 years, as it was early recognized that in this age group the severest infections occur.

"During the years 1920 to 1923, 81 of the 422 counties were resurveyed. In the original surveys of these counties, 89,857 rural school children were examined, of whom 49.471 were infected, giving a rate of 55.1 per cent. In the 1920-1923 surveys 44,090 children were examined, of whom 12,236 were infected, giving a rate of 27.8 per cent, a reduction since 1910-1915 of 49.5 per cent.

"Of the 81 counties above mentioned, 16 in five states—Virginia, North Carolina, South Carolina, Georgia, and Alabama—were resurveyed during 1923. In the original survey of these 16 counties 3,748 children, of 6,331 examined, were infected, giving a rate of 59.2 per cent. In the 1923 surveys 2,058 were positive out of 8,598 examined, giving a rate of 23.9 per cent, or a reduction since the original surveys of 59.6 percent."—*Information Service of the Rockefeller Foundation.*

DIAGNOSIS OF TUBERCULOUS CHILDREN

Remember the following points:

1. Remember the difference between tuberculous infection and tuberculous disease.

2. Remember the frequency of tuberculous infection.

3. Remember that in children tuberculosis is primarily a disease of the glandular system. Whereas in infancy tuberculosis takes the form of a general septicaemia, and is rapidly fatal, in the years of childhood it primarily affects the glandular system all over the body. It is only when this first line of defense is broken through that the lungs or other organs are affected.

4. Remember the importance of exposure, and that bovine as well as human sources are of importance, particularly in the case of children. Tuberculosis in children is often due to tuberculous milk.

5. Remember that in children by the time that the lungs themselves are involved the disease is far advanced. In these real early cases one rarely finds signs at the apices. It is by means of a positive cutaneous tuberculin test, the X-ray, perhaps slight interscapular dullness, sometimes enlarged veins on the chest, frequently a positive d'Espine sign, combined wth constitutional signs and symptoms on which the diagnosis is based.

6. Remember the importance of constitutional signs and symptoms. The principal constitutional signs and symptoms are ease of tire, the loss of weight or failure to gain weight, pallor, malnutrition and debility.

7. Remember that while in adults there is no cough characteristic of tuberculosis, in children there may be present a cough which is more or less characteristic of bronchial gland enlargement. These bronchial glands are situated at the root of the lungs and if they attain sufficient size may press on the trachea, the large bronchi or on nerves, and thereby cause a paroxysmal, strident, brassy cough, usually without sputum, often closely resembling whooping cough.

8. Remember that a positive skin tuberculin reaction is of infinitely greater importance in children than in adults, but that its value becomes less and less wth increased age.—*Bulletin Chicago Tuberculosis Sanitarium.*

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 11071

MEDICAL DEPARTMENT

A Finnish grocer of fifty-six came to the Emergency Ward December 17 for relief of generalized edema of a week's duration. A fragmentary history was obtained from his wife.

F. H. He had been married over twenty years. His wife had had no children and no miscarriages.

P. H. She knew of no previous illnesses. Twenty years ago the patient weighed 160 pounds. He had gradually gained weight until four months ago he weighed 260 pounds and two weeks ago 280 pounds. He became disinclined to work, but maintained an appetite.

P. I. For three years he had not seemed well, had been dyspneic, had seemed sleepy day and night, and frequently dozed off during a conversation. During the naps he talked to himself a good deal. In the past few years he had grown very fat and had developed frequent nose bleeds which grew progressively worse until the past summer, but had decreased in frequency and severity during the past few weeks. For four months his feet had been swollen. Four months ago he became noticeably dyspneic, and during the past month still more so. For six weeks he had been unable to sleep in a reclining position because of orthopnea and cyanosis, so he sat up in a chair or walked about most of the night. On some days during the past week he had raised a tablespoonful of blood. For two weeks he had had generalized edema. He had complained but little of pain, and that over the precordium.

P. E. An obese, water-logged, cyanotic man with Cheyne-Stokes respiration. The skin showed diffuse erythema over the lower abdomen and legs, many excoriations on the legs, and two ulcers on the right knee. Mucous membranes cyanotic. Moderate pyorrhea. *Heart* did not seem enlarged. Sounds faint. (Chest wall very thick.) A soft systolic murmur over the whole precordia. *B. P.* 170/100. *Lungs* clear except for a few coarse bronchial râles in the left upper back and right upper chest in front. *Abdomen* enormously distended, tense. Dull to percussion except high in the midline. Fluid wave. Induration over the lower portion. Palpation of masses impossible. *Genitals.* Massive edema. *Extremities.* Pitting and massive edema of legs. Moderate edema of hands, arms, and back. *Pupils.* Left greater than right and irregular; both reacted. *Reflexes* could not be obtained because of edema.

T. 98°-100.8°, rectal. *P.* 112-58. *R.* 23-32. *Urine.* Amount not recorded, sp. gr. 1.016, slightest possible trace of albumin at one of two examinations, loaded with pus, five to ten red blood cells at both examinations, two trichomonas seen in motion at one. *Blood.* Hgb. 90%, leucocytes 8,000, polynuclears 71%, reds 6,496,000, moderate stippling and polychromatophilia. *Non-protein nitrogen* 46 mgm. *Wassermann* negative. *Abdominal tap.* 2,500 c.c. of opaque yellow fluid, sp. gr. 1.012, leucocytes 1700, polynuclears 13%, lymphocytes 79%, large mononuclears 8%, red blood cells 2500. No organisms. *Culture* negative.

Orders. December 17. Salt free low protein diet. $MgSO_4$ ℥ i in the morning. December 18. Digifolin ampules vi intramuscularly at once. Digitalis gr. vi by mouth at once and gr. iii 4 i.d. Morphia gr. 1/6 s.c. at once and gr. 1/6 s.c. every three hours p.r.n. Limit fluids to ℥ 50. December 18. Caffein sodium salicylate gr. x intramuscularly at once and gr. xv intramuscularly p.r.n. for marked cyanosis or collapse. Digifolin ampules iv. December 19. Caffein sodium salicylate gr. xv.

December 18 the patient became very cyanotic, and the Cheyne-Stokes respiration was marked. Caffein and oxygen were tried. He had in all thirty-three grains of digitalis. At three o'clock in the morning of December 19 he died.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE HISTORY

1. Of course with the knowledge that this patient entered with edema one discounts the idea that his recent increase in weight is due to anything else than dropsy.

2. Nose-bleeds in people past middle life always make us think of hypertension, and so of the possibility of nephritis.

3. His orthopnea and cyanosis cover the period of his increase in weight, and so strengthen what was just said about the probable cause of that.

There is something that I do not understand about the extreme dyspnea of heart disease. We say, in the first place, that people want to sit up because that brings the liver lower and gives the diaphragm more play. But that does not explain why in extreme degrees of dyspnea they

not only want to sit up but they want to lean forward. Anyone who has read of the efforts of mountain climbers to breathe in high altitudes must have noticed that they always have to get forward of the perpendicular. No physiological explanation that I have ever heard covers that. Also these patients always want to get out of bed, to get their feet on the floor. Possibly that is because they can more easily lean forward. But I think there may be another explanation. Doctors are always trying to keep people in bed at this stage and the patients always want to get up. It has been for a good many years my practice to allow them to get up and sit in a chair. Walking about is a different matter. I do not think that one ever would encourage a man in this state to walk about.

NOTES ON THE PHYSICAL EXAMINATION

All of these data I think we can put down to passive congestion and its results.

When we have a blood pressure like this we practically always have enlargement of the heart. That is one of the great things about blood pressure measurement. With it we can find out enlargement when we cannot in any other way. Most elderly people have chests so formed and so thickened that we cannot feel the apex beat and cannot percuss it out. We are perfectly helpless without blood pressure or X-ray, which we practically never have. That is why blood pressure measurement is the most important single method of instrumental examination that I know in medical cases.

I suppose the intestines were floating up in the midline of the abdomen.

The trichomonas do not mean anything.

I do not believe there is anything wrong with the blood in spite of the latter part of the report. I think the high count is from cyanosis.

We have a pretty good account of the kidneys and I do not believe there is anything wrong with them. We have not the functional test, but we have about everything else.

The abdominal tap showed simply a dropsical fluid.

DIFFERENTIAL DIAGNOSIS

On the face of it, this is a case of what Sir Clifford Allbutt calls "hyperpiesis" or "hyperpiesia" or "primary hypertension" with resulting hypertrophy and dilatation of the heart and death from congestion. We use the word "primary" of course always in quotations and with a wink, indicating that it means that we do not know the cause of the hypertension. Everything else that we see in the case is secondary to that.

We do not put nephritis into our diagnosis because there is pretty good evidence that he did not have it.

I do not any longer predict arteriosclerosis as an essential part in the death of a patient like this because I am now convinced that arteriosclerosis does not make any considerable difference in what the heart does and is much more likely to be a result than a cause of cardiac changes. I have no doubt that this man will turn out to have some arteriosclerosis, but I do not think he will have anything else of importance excepting a hypertrophied and dilated heart with sound valves and general passive congestion of all the organs. His arteriosclerosis will probably show some foci in the kidney, but I think the kidney will be functionally sound.

I suppose years ago with a man so fat as he is obviously we should have asked ourselves the question, did not the fat around his heart have something to do with it? In all the old textbooks about the heart we find "fatty heart," "fatty overgrowth" and so on. Today I think nobody believes that fat in or around the heart has anything to do with its functions. So although this is a very fat man and his heart is just the place to look for abnormal fat if we ever do, I do not consider it of any considerable importance in the case.

The diagnosis then is of primary hypertension, which of course cannot be verified post-mortem, with secondary hypertrophy and dilatation of the heart, arteriosclerosis, chronic passive congestion, and nothing else. In the way of guesses we may also add that he may have a terminal infection, because it is so common in these cases to see it post-mortem. But there is nothing in the case to suggest where. It might be pneumonia, pericarditis, or general sepsis.

DR. YOUNG: Why should he have quite so much pus in his urine?

DR. CABOT: I do not know. I suppose he has a right to have an abnormal prostate, but there is nothing in his history that would say so to me. I am accustomed to seeing a good deal of pus in our histories and having Dr. Richardson say nothing whatever about it post-mortem. This is put rather strongly, "loaded with pus," but I can make no guess as to what will be found.

A PHYSICIAN: Why did he spit blood—from edema and passive congestion?

DR. CABOT: Yes. The same thing that makes him spit up serum if we go a little further makes the blood come. There may be an infarct. That is quite possible, with congestion, a lot of blood in the lung.

A PHYSICIAN: In what diseases do you see Cheyne-Stokes respiration?

DR. CABOT: We see it most often in this, the hypertensive type of heart trouble, with or without kidney involvement, in old people. Secondly we see it in kidney trouble of younger people, glomerulonephritis. Thirdly we see it in other types of valvular heart disease, especially in elderly persons. Fourthly we see it in pneumonia and other bad infections, and lastly we see it in brain disease such as tumor and cerebral hemorrhage. What do these

things all have in common? They all have in common poor nutrition of the medulla because of poor blood going through it; in the latter cases I spoke of, perhaps because of more local effects. But our respiration is made to go as it normally does go by stimuli coming from the medulla. When the medulla is not receiving its normal blood supply because of cyanosis or uremia, then the medulla does not do its job or does it only intermittently, and so we get Cheyne-Stokes breathing.

A PHYSICIAN: Do you consider a blood pressure of 170 sufficient to produce cardiac failure without any organic disturbance in the heart itself?

DR. CABOT: Yes. Of course we have one blood pressure measurement only. But I should answer your question just as you put it, yes. I have no doubt he has had higher blood pressure. I have no doubt he has had it lower too. But a blood pressure like this, taken to be a fair sample of measurements which may have been higher and lower, is about what I should expect. We may get blood pressure as high as this up to the very time of death even when the patient is dropsical. People will ask, how can a man have a high blood pressure when he has dropsy? It is familiar that he does have it, I won't undertake to say how. It does not always happen. Some people we have watched have had the blood pressure go down before death. But a blood pressure of which this is taken as a fair sample can produce the whole condition that we see here as a clinical picture, I think.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Hypertensive heart disease with congestive failure.
Hypertension.
Anasarca.
Obesity.

DR. RICHARD C. CABOT'S DIAGNOSIS

Hypertension, "primary."
Hypertrophy and dilatation of the heart.
Arteriosclerosis.
Chronic passive congestion.
Terminal infection?

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

(Hypertension.)

2. *Secondary or terminal lesions*

Great hypertrophy and dilatation of the heart.
General chronic passive congestion.
Hydropericardium.
Beginning hydrothorax.
Ascites.
Anasarca.

3. *Historical landmarks*

Chronic pleuritis.
Lymphoma of the mesenteric and retroperitoneal lymph glands.
Slightly defective closure of the foramen ovale.

DR. RICHARDSON: An enormously stout man. We were not permitted to examine the head. There was massive edema of the lower extremities and genitals. The abdomen was distended, but the wall was not rigid. There was also edema of the upper extremities and the dependent portions of the trunk. The face and ears were purplish. I go into this a little more in detail because it is a classical picture of hypertension.

The muscles were large. The subcutaneous tissues were wet. The peritoneal cavity contained at least 2000 c.c. of thin pale clear fluid. The peritoneum and appendix were negative. The mucosa of the esophagus was pale bluish red, otherwise negative.

The stomach and intestines showed a very striking picture of chronic passive congestion,—the purplish red velvety mucosa oozing thin bloody fluid. This was even better marked in certain portions of the small intestine than in the stomach, but was extraordinarily well marked all along the tract.

The right pleural cavity contained a small amount of fluid, the left 300 c.c.—beginnings of hydrothorax.

The diaphragm on the right was at the fifth rib, on the left at the seventh. There were no pleural adhesions at the apex, but some posteriorly to the diaphragm and some to the pericardium on the right. On the left side there were scattered adhesions to the diaphragm and the pericardium.

The mucosa of the trachea and bronchi was brownish red. They contained much thin bloody frothy fluid. The bronchial glands were plump, brown-red and juicy. The lung tissue was spongy to slightly leathery, brown-red, and yielded a moderate amount of brownish-red frothy fluid,—chronic passive congestion.

The pericardium contained 300 c. c. of thin pale fluid,—hydropericardium. The heart weighed 960 grams,—greatly enlarged. The myocardium was generally thick, of good consistence, pale brown-red. The right ventricle was five to six mm., the left sixteen mm. The columnae carneae were large and thick. There was slight dilatation on the left, marked dilatation on the right. The cavities contained much blood and blood clot, in greatest amount on the right. The valve circumferences were: mitral 11.5, aortic 7.5, tricuspid 13.5, pulmonary 8.5 cm. The valves were frankly negative. The auricular appendices were free. There was a slightly defective closure of the foramen ovale. The aorta and great branches showed only a very slight amount of fibrous sclerosis. Coro-

naries, capacious, free, and the circulatory apparatus elsewhere negative.

The liver weighed 2307 grams, and showed chronic passive congestion. The gall-bladder, except for a little edema of the wall, was negative. The spleen weighed 430 grams,—moderately enlarged, the tissue plump, elastic, brown-red, bloody,—chronic passive congestion.

The kidneys weighed 427 grams; the capsules stripped readily, the surfaces were bluish-brown-red and smooth, the tissue of good consistence, plump, wet. The vessels were engorged, the pelves and ureters negative,—chronic passive congestion.

There was a slight hydrocele on each side.

The inguinal rings were large but free and there was no definite pouching of the peritoneum. The mesenteric and retroperitoneal glands generally were markedly enlarged up to 4½ cm.,—lymphoma.

PLATE I. Left heart. Mitral valve.

A PHYSICIAN: You did not find any reason why the urine should be loaded with pus?

DR. RICHARDSON: No.

DR. CABOT: I think everybody here present should remember the looks of this heart and this history, because it fixes certain things once for all: that we can have a big heart due to hypertension so far as we know, with no nephritis, no arteriosclerosis, no valve lesion,—nothing. Is it rare? No. I suppose it is the commonest of all types of heart disease. I say that because I have just been going over all the necropsies we have had here since Dr. Wright and Dr. Richardson began to do their necropsies. It is the commonest of all heart disease, and in my opinion the nephritis or arteriosclerosis which often goes with it is not the important thing, and no one knows what causes the hypertension.

A PHYSICIAN: I think that is a fact that is very little appreciated by the general profession. What details would you require added to the picture to make a diagnosis of arteriosclerosis?

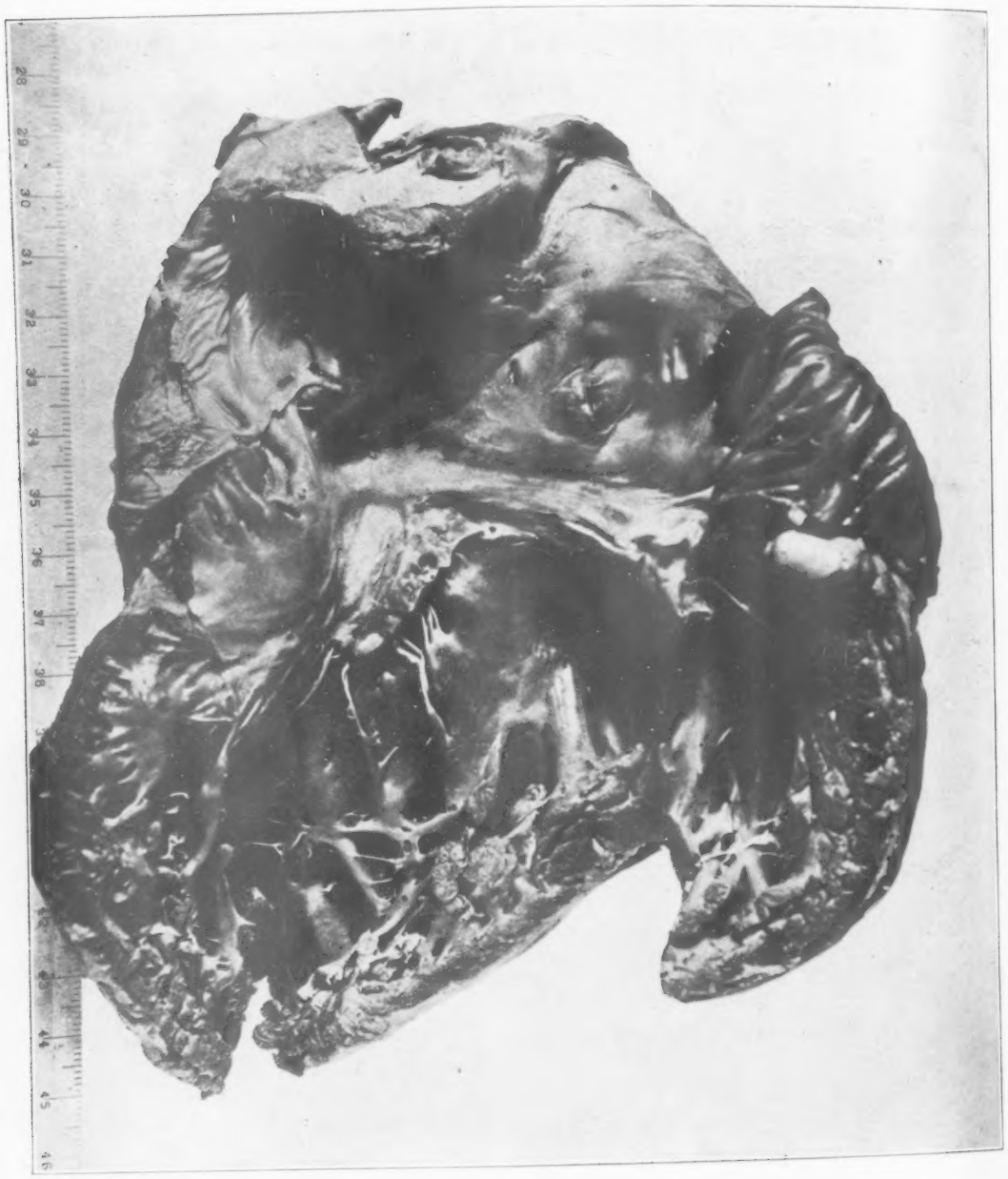

PLATE II. Right heart. Tricuspid valve.

DR. CABOT: None. As I said, I expected to find some arteriosclerosis. If we looked in the retina and saw it, or if you felt it in the brachial, we should say he had arteriosclerosis, but we should not know that it was inside.

A PHYSICIAN: Does that mean that the diag-

nosis of arteriosclerosis is apt to be this condition?

DR. CABOT: Yes.

DR. CABOT: I should like to say a word about a case which I have seen this week and which puzzled me and some others. It is a case of a young girl of twenty who had a fever and nothing to show for it. She felt perfectly well as she lay in bed, had not a symptom, was bright intellectually, had not a pain or an ache. She ran a continuous fever, 102°-104°. She had a low white count, 4,000. She had been within six months given three injections of typhoid vaccine because she was going abroad, to places where she did not know about the water. Therefore of course she now had a Widal, one to fifty, which did not tell us anything. She had no rose spots, no enlargement of the spleen, nothing in the lungs, nothing in the abdomen, nothing anywhere of any importance. If we had not had a thermometer we should have said, "She is a little bit under the weather, not very sick."

I had to make a diagnosis, and just reasoning out as we have so many times here I said, "There are three causes of fever which we often see in this latitude,—typhoid, tuberculosis, sepsis. If she had tuberculosis or sepsis I ought to be able to find it. I have searched her blood and organs again and again. There is nothing anywhere, and her blood is low, fifty per cent. polynuclears, fifty per cent. mononuclears." I made a diagnosis of typhoid, which is a queer diagnosis to make in a person apparently not really ill.

Blood culture was negative. There was one more thing,—stool culture. Stool culture was positive for typhoid bacilli.

Of course the fever is going on, and now we know that it is going on for weeks. But what I see is that the vaccine made the disease so mild, took off all the toxemia we are used to, and that this is the course we have a right to expect in a person who has been thoroughly vaccinated within six months.

This girl really got sick the day before Christmas, was up and about on Christmas day and the day after. She ate a good Christmas dinner, but she had temperature, and she had typhoid on Christmas in my opinion. The blood cultures were done three days after Christmas, and the stool culture four days after Christmas. I think that the vaccine is still in the blood and that makes a poor place for the typhoid bacilli to grow, even though they probably were there.

This is the first time that stool culture has been the one thing to pull me out.

A STUDENT: Isn't it very unusual to get typhoid after vaccination?

DR. CABOT: It is unusual, but it has happened before many times.

CASE 11072

CHILDREN'S MEDICAL DEPARTMENT

A six-year old girl of Italian parentage came to the Emergency Ward November 28.

F. H. Four brothers and sisters were living, five dead. One died at eighteen months of unknown cause, two following instrumental deliveries. The father as a child had frequent nosebleeds.

P. H. The child was normally delivered at full term and was breast fed for a year, then put on varied diet. She cut teeth at six months, walked at fourteen months, was a strong baby, and had excellent health, with no diseases except measles a year before admission.

P. I. On September 10, following the pulling of two teeth, she had profuse bleeding of the gums for twenty-four hours, finally controlled by local application. A week later there was bleeding from the right nostril for two hours. A month later the left nostril bled for two hours or more. During the past two weeks attacks of bleeding had occurred nearly every day, during the past week lasting about half an hour at a time. The day of admission bleeding started at six in the morning and continued at intervals until five in the afternoon.

P. E. A well nourished child with slight oozing of blood from the left nostril. Slight icteric tinge over forehead and face. Mucous membranes pale. Slight reddish areas in the left inner cheek above the second molar and in the midline of the upper lip. *Lungs* clear. Apex impulse of the *heart* in the fourth space. Action regular, rapid (132). Sounds of fair quality. A soft systolic murmur at the apex. *Abdomen.* Liver edge palpable 1 cm. below the costal margin. *Genitals* and *extremities* showed nothing significant. *Pupils* normal. *Reflexes.* Knee-jerks active.

Before operation *T.* 98.5°-101.5°, *P.* 102-151. *R.* 12-32; amount of *urine* not recorded, sp. gr. 1.012, other findings negative; *blood*, hgb. 60%-80%, leucocytes 7,200-7,350, polynuclears 60%, reds 3,248,000-3,312,000, *Wassermann* negative. *Bleeding time* November 28 18 minutes, December 3 35 minutes. *Coagulation time* (1) 10 minutes, (2) 13 minutes, (3) 14 minutes, (4) 12 minutes; clot did not retract after 72 hours observation. *Schick test* negative. *Tuberculin test* negative. *Throat consultation December 3.* "Can see no local point of bleeding. Adrenalin advised for temporary use when bleeding warrants the use of local measures." *Medical consultation December 4.* ". . . . Practically no blood platelets in smear. No clot retraction. Prolonged bleeding time. Patient now has hemoglobin of about 30%, pulse 150, and should be transfused. Why not do a splenectomy after getting hemoglobin up to 80 or 90%?" *Surgi-*

cal consultation December 5. ". . . . Advise splenectomy. Prognosis good. Believe operation could be done to-day with a preliminary transfusion. If operation is done later advise transfusion and immediate splenectomy."

December 3 bleeding from both nostrils started and fairly large clots formed. That from the left stopped in a short time, that from the right required packing with adrenalin. After it was checked there was still occasional oozing from both nostrils and from the gums of the lower incisors.

December 4 the child was given transfusion of 250 c.c. of her father's blood. After this there was no bleeding until December 6, when there was slight oozing during the night. The next morning there was slow oozing from both nostrils; not much actual blood loss. This was partly checked by adrenalin packs. That day several purpuric spots 2-3 mm. in circumference were noticed for the first time on the lower extremities, the abdomen, thoracic and cervical regions. These did not fade on pressure.

December 8 another transfusion of 250 c.c. of blood was done, followed by operation. The patient did very well after it. December 12 there was slight bleeding from the nose, which soon stopped. She made an uneventful convalescence, and December 23 was discharged with the wound clean and well healed.

Discussion

BY DR. FRITZ B. TALBOT

The history of bleeding in this case was a month and a half before entrance into the hospital. During the past two weeks the bleeding has been much more severe.

Purpura hemorrhagica occurs in two ways, either as a definite idiopathic disease or as a symptom of some other disease such as pernicious anemia, lymphatic leukemia or severe infection. It is characterized by spontaneous bleeding from the mucous membranes, purpuric spots in the skin and a marked diminution of the blood platelets. It should not be confused with other types of purpura which have the normal number of platelets, nor should it be confused with scurvy. The disease may be acquired or congenital. The disease may occur at any age, but is most common between the ages of twelve and twenty-five. It is apt to recur in the same individual and to come out of a clear sky. It may end fatally in twenty-four hours because of bleeding. The most prominent symptom is bleeding from the mucous membranes. It varies in degree from a slight oozing from a single source to marked epistaxis. There may be cutaneous hemorrhages, especially on the legs. The purpuric spots may be small and isolated or large and confluent. The color does not disappear on pressure, but as time goes on it gradually fades out, as in all hemorrhages. There may be fever in the severest cases, but it is usually absent in the chronic ones. The disease may appear intermittently for many years; this type is seldom fatal. However, each successive attack is apt to be severer than the one preceding, and eventually the patient may die of hemorrhage.

Differential diagnosis depends upon the examination of the blood and upon the physical examination. The aleukemic stage of lymphatic leukemia as well as of aplastic anemia, sepsis and infectious diseases should always be ruled out as a cause of the purpura. Purpura hemorrhagica is distinguished from other types of purpura by the fact that the blood platelets are greatly diminished. The therapeutic effect of fresh vegetables and fruits on a case of purpura will quickly rule out the possibility of scurvy. Purpura may at times be confused with hemophilia, but the two conditions can be differentiated by examinations of the blood and by the history. In purpura hemorrhagica the coagulation time is usually normal and is very rarely much prolonged, while in hemophilia the coagulation time is much prolonged. In purpura hemorrhagica the blood clot does not retract and is soft, while in hemophilia it is firm and retracts. The bleeding time in purpura hemorrhagica is prolonged, while in hemophilia it is essentially normal. Blood platelets in the former are markedly decreased and in the latter are essentially normal.

Treatment. After severe hemorrhages there is usually a marked anemia. In purpura hemorrhagica it may be severe enough to require blood transfusion. This was done twice in this child. An attempt was made to bring the blood as nearly back to normal as possible. The spleen was then removed. The subsequent history was uneventful. The removal of the spleen in this condition has in our clinic proved to be very satisfactory. In the cases that have been under observation for varying lengths of time there has been no recurrence of the purpura after the patient has recovered from the operation. So far as I am able to determine the removal of the spleen does not result in any known harm to the patient, either in the function of his organs or in his physical development.

Pre-operative diagnosis

Purpura hemorrhagica.

Operation

Ether. Left upper rectus muscle splitting incision. The spleen was enlarged to two or three times its normal size. It was easily delivered into the incision. There were no marked adhesions to the diaphragm. The pedicle was tied off in sections and the spleen excised. Incision closed without drainage. The operation was accomplished with great ease.

PATHOLOGICAL REPORT

The spleen measures 2.5 by 2.5 by 14 cm. and weighs 125 grams. On section it shows a firm bright red surface with visible nodules.

Microscopic examination shows an increase of the connective tissue of the reticulum and a hyperplasia of the lymphoid cells of the sinuses of the pulp. There is no evidence of hematopoiesis. The lymph nodules do not show prominent germinative centers.

Hyperplasia.

DIAGNOSIS

Purpura hemorrhagica, acute.

CASE 11073

SURGICAL DEPARTMENT

A Canadian housewife of sixty entered November 6 complaining of extreme weakness and diarrhea of eight months' duration.

F. H. Good.

P. H. She was easily worried. She had one miscarriage. For several years she had urinated usually once or twice at night. She had influenza twenty-one months ago.

P. I. She had felt nervous and low spirited ever since her son went to war. Fifteen months ago she had an attack of influenza. She became very weak, and afterward had bad cough for weeks, vomiting frequently during paroxysms of coughing. Since that time she had never felt well. For the past year she had had occasional periods of hemorrhage from the bowel, sometimes bright red blood, sometimes dark red. The last one was three weeks before admission. She felt that she was regaining strength when her son was drowned. She had a collapse and was in bed seven weeks. Since that time she had not been at all well. She had occasional short attacks of nausea, usually following indiscretions in diet. She complained of gas in the bowel, at times very disturbing. She had lost many pounds in weight in the last four years, particularly since last winter. For four weeks she had had some numbness below the knees and jumping sensations in the throat.

Records of the Out-Patient Department, October 31. Examination showed an irregular lobular mass the size of an orange with tenderness in the left lower quadrant, and a small irregular mass just below the ensiform on deep palpation.

P. E. A weak, cheerful elderly woman showing very marked recent loss of weight, though her face was not thin. Mucosae pale. Marked pyorrhea. *Lungs* clear. *Heart* negative except for a systolic murmur, harsh at the base and soft blowing at the apex. Radial arteries palpable. *B. P.* 90/50. *Abdomen.* Marked emaciation. Seemed distended. Visible peristalsis near the umbilicus. Liver edge palpable. A "nodule" felt deep in the right upper quadrant, too hard for feces. In the left flank a fairly large mass, firm and rounded, not definitely nodular, the superior border of which could be defined. On very light palpation a small free mass could be felt under the sternal border, easily displaced, probably fecal. Peristalsis visible but not indicative of obstruction. *Rectal examination* negative. *Pelvic examination.* Adhesions (postoperative?) across top of vault. Cervix not palpable. Vaults clear.

Before operation *T.* 97.6°-100.6°, *P.* 79-110, *R.* normal; amount and sp. gr. of *urine* not recorded; one of three catheter specimens showed the slightest possible trace of albumin and 25-50 leucocytes, another 1-2 leucocytes. *Cultures.* I. Profuse growth of colon-like bacili. II. Streptococci. III and IV. No growth. *Blood* before operation. Hgb. 45%-55%, leucocytes 8,100, polynuclears 78%, reds 2,624,000-2,656,000, some anisocytosis and poikilocytosis, slight achromia. *Wassermann* negative. *Nonprotein nitrogen* 27 mgm. *Stools.* Guaiac very strongly positive at all of three examinations. Macroscopic blood at one. *Surgical consultant.* " . . . Advise operation."

November 13 operation was done. Next day a supplementary operation was done, and transfusion of 750 c.c. of blood. November 15 the patient was comfortable, but very ill. November 16 there were signs of obstruction and the temperature was rising. The bowel was opened and a catheter put in. Much gas was expressed. The temperature and pulse came down. November 17 the patient was comfortable. There was some gas. Nourishment was started. Following this she seemed to be somewhat out of her mind at times and looked septic. The wound was irrigated. A septic process started in the mouth, making it very difficult for her to swallow. A throat consultant reported, "Stomatitis. Superficial ulceration, posterior pillars both tonsils. Recommend frequent swabbing of teeth and mouth, as the patient can not tolerate a douche." A skin consultant reported, "This seems to be the kind of mouth that comes from long continued liquid diet and no mastication of solids combined with continued mouth breathing. Can she have something to chew? Also I think potassium permanganate 1-100 aqueous solution, swabbing done frequently will help."

The skin around the wound was in very poor condition. The patient had diarrhea, relieved by bismuth. The throat was very troublesome. Orthoform applied to the tongue to help her at meals was without result. She was at times somewhat demented. The wound was put on constant suction. The mouth was washed with

potassium chlorate. Culture from the mouth and throat showed a profuse growth of staphylococcus aureus, Gram-negative bacilli and streptococci. The throat improved somewhat. The suction was stopped November 27, as the diarrhea was better. As the diarrhea started again the next day the bismuth was increased. The evening of November 29 the patient died.

Discussion

BY DR. EDWARD L. YOUNG, JR.

Does this mean that the patient had a second attack of influenza?

Miss Painter: Yes; there seem to have been two separate attacks.

Dr. Young: This is a story which after we go over it all points very definitely to the intestinal tract. I do not see how we can assume that the influenza or her nervousness are connected with this other than incidentally. The definite thing that it shows is the story of hemorrhages from the bowel, gastro-intestinal symptoms of nausea and gas, and then this loss in weight and strength particularly in the last eight or ten months, that is, during the time that she had the hemorrhages.

In any thin abdomen we can of course get visible peristalsis without its meaning anything pathological.

Are you omitting the X-ray, or was this so obvious to them that there was none?

Miss Painter: There was none.

Dr. Young: This seems like a very definite story as we read it over. The passage of blood always means something that should be investigated, because it is more often serious than not. What are the possibilities? A mucous colitis as the starting-point of a more serious colitis, because they sometimes do start in that way and become chronic or acute ulcerative colitis. This would have had a different story in the constant tenesmus and the passage of blood, mucus and pus, not in the definite attacks of bleeding with nothing in between times. It does not seem as if we could really put it down to definite colitis. And then the finding of the mass in the left flank and under the liver of course suggests the development of malignant disease. She has had no attack of acute obstruction, but that of course is not necessary for a long time if the carcinoma of the bowel develops in such a way as not to obstruct. It does not seem as though with the blood, the intestinal symptoms and the loss of weight it is fair to assume any other diagnosis than malignant disease. And operation of course is done on the basis of the fact that we do not know how far that has extended, whether the mass under the liver is perhaps a metastasis, perhaps just a mass of feces, possibly a gall-bladder separate from this, and that it may in fact be a curable condition. So that I should assume on the facts here a diagnosis of malignant disease of the descending colon with possible metastasis in the liver, and operation done on the basis of that diagnosis.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Malignant disease of the colon.

PRE-OPERATIVE DIAGNOSIS

Cancer of the descending colon.

OPERATION

Gas and ether. Left rectus incision at about the mid portion. The abdominal wall was very thin and the muscles were practically all frayed out. There was a fairly large contracting growth just below the splenic flexure. Below this and extending down from this was a very large cauliflower mass which distended the upper portion of the sigmoid to a diameter of two and a half inches. The transverse colon had fallen down upon the growth and become adherent, leaving a loop of about eight inches between this attachment and the growth. On the inner side a piece of small intestine had become firmly adherent and apparently involved in the growth for an area of about one inch. The bowel was freed nearly to the middle of the transverse colon and the sigmoid flexure was freed to the brim of the pelvis. This necessitated taking a V-shaped piece out of the top of the small gut, which was closed with the usual intestinal sutures. The whole mass was brought into the wound and the transverse colon sutured to the sigmoid flexure above and below the growth. The wound was closed about the growth, leaving the mass attached for the purpose of doing a Mikulicz. The condition of the patient was extremely bad during the rest of the operation. At the end of operation a surgical transfusion of 750 c.c. was done for hemorrhage and shock. Only a slight amount of blood was lost during the operation.

November 14 the growth was removed to prevent further hemorrhage.

PATHOLOGICAL REPORT

The sigmoid and splenic flexure of the colon with their fat mesentery. A large cauliflower-like growth dilates the sigmoid. The proximal end of the splenic flexure is adherent to this mass, and a sinus runs from its mucous surface to the center of the tumor. A small button-shaped piece of small intestine is also adherent and united to the growth by a narrow sinus.

Microscopic sections through the tumor and the underlying fibrous tissue show irregular gland tubules of atypical columnar epithelial cells with extensive fibrosis. There are large areas of necrosis.

Adenocarcinoma with invasion of the mesentery and extension into adherent portions of large and small intestines.

Further Discussion

The story as they saw the patient was probably as clear as it seems to us, because they made the same diagnosis.

In other words it was, because of the involvement, a long, shock-producing operation.

The possibilities here of course are for the spread of sepsis, because of the extensive suturing that had to be done, or that the shock might kill, or that because of adhesions the bowel will not function properly.

She died just two weeks after operation. I do not think there is anything more necessary to account for that ending than the fact that a very extensive operation was done on a woman who had lost all her reserve strength and had nothing to come back on. Whether or not Dr. Richardson will say that there is a moderate amount of sepsis I think it is hard to say. But there is no question but that the condition of the mouth, of absorption perhaps from that, and inability to get sufficient nourishment probably helped the ending. I do not see any reason to assume any other conditions connected with the story.

Clinical Diagnosis (from hospital record)

Carcinoma of the colon.
Sepsis.
Resection of growth (Mikulicz).

Dr. Edward L. Young's Diagnosis

Malignant disease of the colon.

Anatomical Diagnosis

1. *Primary fatal lesion*

(Adenocarcinoma of colon.)

2. *Secondary or terminal lesions*

Resection of colon for adenocarcinoma.
Extensive necrosis and purulent infiltration of the abdominal wall.
General peritonitis.
Slight colitis.
Fatty metamorphosis of the liver.

3. *Historical landmarks*

Slight chronic pleuritis.
Small fibromyoma of the uterus.

Dr. Richardson: The margins of the operation wound showed great necrosis and purulent infiltration. The peritoneal cavity showed frank general peritonitis. The gastro-intestinal tract was negative except that at one point in the region of the upper end of the jejunum there was a sutured wound, but the sutures were loose.

Dr. Young: Was there a lead from that?

Dr. Richardson: It is hard to say. The sepsis was so extensive at the time of necropsy that one could prove any hypothesis.

The two ends of the sigmoid were sutured in the wall of the operation wound. The wall of the proximal colon was slightly thickened, there was slight reddening of the mucosa,—colitis, and that was all.

There was only a slight amount of arteriosclerosis and the circulatory apparatus elsewhere was negative.

The liver showed some fatty metamorphosis, no metastases. The gall-bladder contained very little bile. The kidneys were rather small but otherwise negative. There was a small fibromyoma of the uterus.

Dr. Young: In spite of the entire lack of any evidence of general peritonitis before death we are not at all surprised at Dr. Richardson's telling us that it was there, because he does so often in these cases. And I think it is wise occasionally to emphasize the fact that however important technique is in these operations it is not necessarily the slip in technique which has allowed contamination of the wound. It is the fact that the soil is so thoroughly prepared beforehand. Because of her lack of strength and lack of resistance the infection is going to develop. It is not the fault of the surgeon; it is the fault of the tissue that he is working with. Because peritonitis will develop on the basis of almost nothing, whereas we see so many times, especially in healthy youngsters who develop an appendicitis that ruptures without any walling off, with a seemingly general peritonitis, and they get well as though nothing had happened. In that case the soil is prepared for health, as this was prepared for disease.

Dr. Richardson: Did she have much anemia?

Dr. Young: She had a very considerable degree of anemia to start. That is of course another very important factor in lowered resistance.

A Way to Help Nervous Children

A practical suggestion for helping children to overcome nervous habits such as temper tantrums, thumb sucking, bed wetting, fussy, finicky appetites and the like, is offered by the Habit Clinic.

This plan should be used merely as an adjunct to other treatment.

Suppose we are dealing with a capricious appetite for which the doctor has ordered a glass of milk at each meal and which is refused. Secure a piece of cardboard, explaining that you want him to help play a game. Draw seven equally spaced horizontal lines on the card, writing in at the left-hand margin of each the day of the week. Next divide the card by drawing three vertical lines, writing in at the top of each space in succession the words "Breakfast," "Lunch," "Supper."

Tell the youngster that for every meal he drinks his milk he is entitled to paste a tiny gold paper star in the space representing that meal. For meals in which milk is refused no star may be used. The first time he secures an entire card (representing 21 consecutive meals) without blank spaces, he will receive a prize. This may be an inexpensive toy.—*The Massachusetts Society for Mental Hygiene, Monthly Bulletin.*

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THE MOST INTELLIGENT RACE

In these days psychology is considered, and rightly so, an important branch of medical science and psychologists are ever attempting by means of this science to unravel some of the mysteries which enshroud certain mental process and by discovering their origin to treat them by effective psychological methods. Success has attended some of these efforts, and when it is realized how greatly the mind influences the body and the body reacts on the mind, it may be predicted that in the future the form of treatment will have a much extended scope. As said before psychologists are extremely active at the present time, and are delving into numerous recondite problems in connection with the subject. For some time past American psychologists have been concerned in the attempt to assess and grade the mental capacity, in the first place of school children, and secondly of nations as a whole. Dr. Carl C. Brigham, assistant professor of psychology in Princeton University, has completed recently an analysis of a memoir published by the National Academy of Sciences upon 116,000 mental tests carried out in the American Army during the war. In these tests 81,000 native born Americans, 12,000 foreign born and 23,000 negroes were submitted to examination. It is interesting and important to note that the tests were designed to measure native intelligence irrespective of educational acquirements. Some were adapted for the wholly illiterate and others for those with no knowledge of English. These analyses of these examinations led Prof. Brigham to make what may be thought to be somewhat invidious comparisons, although, of course, no slur on any race or offshoots of a race was intended. The analysis places in order of intelligence—1, English; 2, Scots; 3, Dutch; 4, German; 5, American (white); 6, Danish; 7, Canadian; 8, Swedish; 9, Norwegian; 10, Belgian, 11; Irish; 12, Austrian; 13, Turkish; 14, Greek; 15, Russian; 16, Italian; 17, Polish; 18, American (colored). From the above analysis Prof. Brigham makes some gloomy deductions and forecasts a grave deterioration in American intelligence. In fact he states that, according to all available evidence, American intelligence is declining, and will proceed to decline at an accelerating rate in proportion as the racial admixture becomes more and more extensive. If immigration were stopped now, the decline of American intelligence would still be inevitable. However, it may be pointed out that these forebodings are considerably discounted when the situation is examined critically. It is most difficult, almost impossible, to make accurate intelligence tests upon groups of people drawn from various nations. All the European nations are of more or less mongrel stock and it is confusion of meaning between the terms, race and nationality, which gives rise to so much misapprehension. In the analysis "Americans" are compared to the European people classed as nations, while later it states that the blond Nordic is superior in intelligence to the Alpine and the Mediterranean. Of course, the population of England and Germany not to mention America is very mixed. According to some authorities the basis of the English population is Mediterranean, there are also members of the Nordic type and again the mixed Alpine types. In Germany there are both Nordic and Alpine types, while, of course, the American nation is composed of a mixture of all the nationalities of Europe, with possibly Nordic types predominating. An analysis as conducted by Prof. Brigham must, it seems, lead to doubtful or misleading conclusions. The statistician to be accurate must sort out all the different types from the various nationalities and then make his analysis. Perhaps superior intelligence is to some extent a matter of education, environment and because the members of a given nation have come under the influence of a definite social tradition. The differences in temperament between the various light skinned nations are obvious but to make reliable intelligence tests is much more difficult. Indeed, intelligence tests are of so delicate a nature in the making of which so many intricate

points have to be considered and accurately estimated that while such tests are of value there does not seem to be many reasons for despondency, because those undertaken by Prof. Brigham appear to show that the native inhabitants of America are inferior in intelligence to the inhabitants of several European countries. Moreover, have not climate, food and conditions of life some influence on the development of intelligence. They certainly have on the development of character. The fringe of the subject has only been touched and the intelligence of nations or races as gauged by psychology is deserving of further study.

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The conclusion seems logical that, far from being inheritable, tuberculosis in the parent tends to confer an immunity on the child.

It is not fair to assume, however, that the germ plasm has of necessity any part in the transference of the immunity. Few types of immunity that are passively acquired are of any great duration. Infants born Schick-negative become Schick-positive within a very few months. It is well known that immune bodies introduced artificially are very short-lived. Racial immunities and racial or individual resistance to disease are little understood factors. With our knowledge, however, that infectious diseases are generally not directly heritable, it seems logical to assume that increased resistance rather than an increased susceptibility should be the result of such a general prevalence of a disease as has been the case with tuberculosis. Drolet's figures on an improving number of cases seem to bear out such an assumption, as does our knowledge of the history of such infections as syphilis and measles.

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Acute dilatation of stomach foll. Cesar.	1		
Paralytic ileus foll. low forceps		1	
Difficult labor, version, shock		1	
Acute articular rheumatism and chronic endocarditis. Premature labor	1		
Acute inversion of the uterus	1		
Postoperative shock, childbirth		1	
Rupture of uterus			2
Acute dilatation of the heart in labor			1
Puerperal septicemia	6	6	6
Puerperal embolism	6	1	3
Puerperal albuminuria	12	11	12
Totals	29	24	33

Of the above deaths two due to embolism were associated with Cesarian section, as was one due to albuminuria. One incomplete miscarriage was complicated by bronchopneumonia, while one of the deaths from septicemia and septic pneumonia followed an abortion. One septicemic death was reported as due to hemolytic streptococcemia from throat, with childbirth normal. Gangrene of the perineum caused one death from septicemia. One toxemic died of acute dilatation of the heart associated with a high forceps delivery. A rupture of the uterus was contributory to the death of one patient from septicemia, and acute pyelonephritis to another. One of the cases of placenta previa had an ensuing septicemia.

MISCELLANY

A CORRECTION

FURTHER information confirms the truth of the previous statement referring to the graduation of the late Dr. Vinson Meader Tirrell. He was a student in the Harvard Medical School for a time but graduated from the College of Physicians and Surgeons of Boston.

MALARIA CONTROL IN THE UNITED STATES

"The present general campaign against malaria in the Southern States of the United States may be said to have started in 1917, in and about the many army camps scattered from Maryland to Texas. Naturally the work inside the camps was done by the army, and that in the environs by the United States Public Health Service, which enlisted, so far as possible, the assistance of the state and the local communities. With the close of the war this particular effort stopped. As a war measure it had been carried out regardless of expense; the cost was invariably high, and sometimes where the camps, for strategic reasons, were located in regions where the control problem was especially difficult, it was very high. The hesitation of smaller and poorer communities to undertake the work was easily understood.

"Previous reports have told of the pioneer work of the International Health Board in malaria control, beginning in 1916. By a series of demonstrations, it was able to show that malaria control need not be expensive, but that an average community can virtually rid itself of the infection at a per capita cost of from $0.45 to $1 a year, provided a careful preliminary survey is made to define the particular local problem. When adequate control measures have once been established they can be maintained from year to year at a much lower per capita cost. The results of the demonstrations were brought to the attention of state health authorities, and an ever-increasing number of projects have been undertaken by the community or county, the state, the United States Public Health Service, and the International Health Board.

"For malaria prevention, as for public health work in general, the county is a better administrative unit than the town, since county organization makes for greater stability and continuity of effort. During the past year the Board's work has been carried out on a county basis. Wherever possible the control campaign is directed by the county health officer, with the advice and assistance of the state health officer and his staff. During the year, seventeen new counties undertook antimalaria campaigns in addition to those previously organized."—*Information Service of the Rockefeller Foundation.*

THE GROUND-BREAKING CEREMONY OF THE NEW MEDICAL CENTER IN NEW YORK

GROUND has been offiially broken and actual construction begun on New York's new Medical Center, which is being developed under the direction of the Joint Administrative Board of Columbia University and Presbyterian Hospital. At the exercises held Saturday, January 31st, on the twenty-two acre plot at 168th Street and Broadway before a notable gathering of representative persons of the metropolitan district, including many of the profession, Mr. Edward S. Harkness, the first Chairman of the Joint Administrative Board, turned the initial spade of earth. This act signalled the starting of the construction of the first and largest unit of the Center, the combined new Columbia University School of Medicine and Presbyterian Hospital—a Ten Million Dollar structure.

General William Barclay Parsons, Chairman of the Joint Administrative Board, presided. He spoke briefly of the history of the project and its objectives, stressing the value to the community of the potential forces in the combination of medical profession, university, and

State when welded into one instrument for their service.

The real work of the Joint Administrative Board has just begun. There are yet many institutions to follow. With the present units being built will be assembled a School of Nursing, a maternity hospital, a children's hospital, an eye hospital, an ear, nose and throat hospital, an orthopedic hospital, a urological unit, a dermtological hospital, a School of Dentistry, and such other institutions of patient care, teaching and research as are needed to fully complete the Center.

Representing the Presbyterian Hospital, Mr. Dean Sage, President of the Board of Managers said, "Many years ago two partners, Columbia University and the Presbyterian Hospital, conceived a vision. That vision was born of a wish to accomplish for the City of New York a broad union of the forces of medical practice, education and research to the end that man might reap the benefit. The way was unknown; it proved to be fraught with difficulties; but the vision ever beckoned.

"During the intervening years the Presbyterian has schooled itself for the test through transformation into a teaching hospital. For more than half a century we have labored for the people of the City of New York without regard to race, creed or color. Now, our service, enlarged and vitalized through affiliation with the School of Medicine of Columbia University, seeks at once the alleviation of suffering, the advancement of medical science, and the progress of medical education. We believe that we are fitted to undertake our share in the great nation of medical profesison, university, and work of the Medical Center."

President Nicholas Murray Butler speaking for Columbia University said:

The first turning of the soil on this spot is the beginning of the fulfillment of a prophecy that was made at the annual Commencement of King's College held one hundred and fifty-six years ago. It is the beginning of the accomplishment of a dream that has been in the mind of many of us for a long generation past. It signifies that at last two aspects of medicine—the scientific and the philanthropic—are to be united in bonds that cannot be broken, as part of a new and vital union of organization, of purpose, and of public service. It means that a fully equipped university shall hereafter have at the service of its teachers in medicine an ample and thoroughly modern series of laboratories and clinics. It means that a noble hospital, with a long record of public service behind it, from this day forth commands the best, the very best, that science, academic experience and personal devotion can give to ground the service of that hospital on the unshakable foundation of mdern science in all its many-sided phases.

This, Mr. Chairman, is no ordinary event. The healing art, which is medicine, was one of the first branches of ordered knowledge to be organized by civilized man. So potent and so significant was it that its earliest affiliations were with religious faith and with religious practice. It need not yield these relationships in taking on its new ties with science. Hippocrates, whose noble form of words we use today in adjuring the young graduate in medicine to aspire and to adhere to the highest standards of his profession, took rank in his time with the poets, the orators, and dramatists of his age. From his day to our own an immense literature and a marvelous expansion have attended this branch of knowledge. It affects intimately every individual, every community and every nation. Physical, mental and moral health are the condition of happy life and of effective service.

Here on this site, through generous and broad-minded coöperation of many groups, and with the princely benefactions of those whose highest concern is for man, we propose to build a monument more lasting than bronze which shall testify alike to the growing power of human knowledge to minister to the physical and mental ills of man and to the zeal of civilized man to help and to cure his less fortunate fellows.

REMARKS OF C. FLOYD HAVILAND, M.D., CHAIRMAN OF THE NEW YORK STATE HOSPITAL COMMISSION

The great medical center to be established upon this site should have a significance for every member of the community. The scope and character of the work to be done here will insure results which, directly or indirectly, will benefit all mankind, but the immediate beneficiaries will be the citizens of New York City and State. New York City will be a better place in which to live through the establishment of this medical center. The project should therefore enlist the interest and support of all public spirited citizens. When it becomes possible to evaluate the actual work of the center as expressed in terms of human welfare, its social value will be unmistakable.

But despite the work of private agencies in combating disease, the State has no more important function than to safeguard public health, the basis of all social progress. Public health implies mental health as well as physical health. The State spends considerable sums in combating physical disease, but a far greater drain upon the State Treasury results from mental disease. The very extent of the problem of mental disorders renders it necessary for the State to assume the burden, as no lesser political unit, no private organization, could command sufficient financial organization, could uately deal with the situation. For years the State has spent ever-increasing sums for ever-increasing numbers of mentally disabled persons, there now being nearly 43,000 in the New

York State Hospitals. It is thus of vital importance to the State to seek effective means to prevent mental disease. It is now doing preventive work, so far as facilities permit, but no adequate facilities have been aavilable for intensive research work, which alone will render it possible to successfully combat a menace all too little appreciated by the general public.

Fortunately for the State of New York, the coöperation of the Joint Administrative Board and the New York Hospital System will render it possible to supply the lack of a psychiatric research center. The State Psychiatric Institute and Hospital to be erected as a unit of this general medical center will meet an essential public need.

Each medical specialty gains through contact with other specialties and with general medicine and surgery, but psychiatry as a medical specialty has especial advantages to give and to receive. The mind is not something apart and distinct from the physical organism. Man is a psycho-biological unit in which psychic and physical elements are intertwined and interdependent. Hence disorders of one affect the other. Therefore the inclusion of a psychiatric unit in a medical center is necessary to render complete service to suffering humanity. As a representative of that department of the State government concerned with mental disease, I welcome the association of the State in this great enterprise. It can but result in mutual benefit. It represents an effort to lessen the burden of mental disease now borne by the people of this State. Certainly State authorities should do no less than support such an effort.

The State Hospital Commission is keenly interested in the development of the center and in the construction of the unit over which it will have jurisdiction. The Commissioners appreciate the privilege of working with the members of the Joint Administrative Board in an enterprise so fraught with possibilities for good. It is convinced that the State has become associated with a project which has boundless possibilities for human welfare, and the influence of which will be far-reaching and enduring.

HARVARD MEDICAL SCHOOL SCHOLARSHIP ASSIGNMENTS 1924-25

Name of scholarship and assignment for 1924-25:

E. M. Barringer—No. 1, Percy Albert Brooke; No. 2, Richard Bartley Cattell.

Gordon Bartlett—John William McKoan, Jr.

Matthew and Mary E. Bartlett—James Reginald Linton.

Lucius F. Billings, Isadore Olefsky, Euclid Peter Ghee.

Orlando W. Doe—Joseph Seaton Barr.

Joseph Eveleth—John Howard Powers, Burdette Jay Buck, Jacob Lerman.

Horace P. Farnham—Marshall Coulter Balfour, Joseph Albert Sullivan.

Hilton—John Whitfield Larrabee, Edward Patrick Dunn.

W. O. Johnson—William Vernon Cox.

C. M. Jones—Frederic Arthur Patterson.

Abraham A. Watson—LeRoy Goodman.

A. H. Linder—Cornell Gilbert Gray.

J. P. Oliver—Carl Henry McMillan.

Charles B. Porter—Parker Calhoun Hardin.

C. Pratt Strong—Howard Beeman Hunt.

F. Searle—Theodore Read Dayton.

Isaac Sweetser—Samuel Glenn Major.

John T. Taylor—John Pallo.

Major Harrison Briggs Webster—Edwin Russell Durno.

Edward Wigglesworth—Edwin Marshall Deery.

Cotting Gift—Aristocles George Anastasis.

John Foster Fund—John Berell Sears, Daniel Vincent Troppoli.

Walker Scholarships—Dr. Charles Walker, Donald Clare Hoffman; Helen L. Walker, Elbert Lapsley Persons; Anna G. Walker, Alfred Mortimer Roscoe; Leslie W. Walker, Edgar McClain Neptune.

DINNER TO DR. BALCH

On January 30th the Trustees of the Massachusetts General Hospital gave a dinner to Dr. Franklin G. Balch, the occasion being his retirement from the Staff of the Hospital. For over thirty years Dr. Balch has served the Hospital in various capacities, his last position being Chief of a Surgical Service and Chairman of the Executive Committee. At the dinner, which was held at the Copley Plaza Hotel, there were present about fifty guests, including the Trustees and many members of the Hospital Staff. Mr. Wigglesworth, Chairman of the Board of Trustees, was toastmaster; the speakers were Dr. David Edsall, Dr. Richard H. Miller and Dr. Frederic C. Washburn, who expressed the high esteem in which Dr. Balch was held by all who had come in contact with him, and testified to the value of his services to the Hospital.

CORRESPONDENCE

SPECIAL LETTER FROM DR. GEORGE L. RICHARDS

Editor, Boston Medical and Surgical Journal:

Dear Sir—To write a travel letter these days, when so many go around the world either as independent or personally conducted travelers, and when the movie picture has made all lands visible to the eye, requires some courage.

The usual travel letter omits much which is of interest to the doctor, so in this letter I will try and tell of things of special interest to the physician.

Cairo, Egypt, is a familiar spot, and Shepheard's Hotel—which appears, and deservedly so, in all the stories about Egypt—is the place to stop.

A few miles out of Cairo are the Pyramids of

Ghizeh, familiar to us all in picture since the days of our first geography study—and they look just like their pictures. I had visited them on a former occasion and had much regretted that I had not taken up the offer of the Arab who wanted to run or climb to the top of Cheops and down again on a time wager.

The height of Cheops, the largest of the pyramids, is variously given as from 455 to 475 feet, and the blocks of stone of which it is composed are three or more feet in height at each tier. In Mark Twain's "Innocents Abroad" he gives an account of a run to the top of the next smaller pyramid, which is smooth stone for some 40 or so feet from the apex and therefore more difficult to climb. His Arab did the feat in nine minutes as per contract, although "Mark" had hopes he would fail—and at one time thought he was going to.

My Arab, a man of about 26 years or so, offered to go to the top of the great pyramid and down again in eight minutes for the sum of two American dollars—and, of course, the usual backsheesh in addition. No money was to be paid if he failed.

I sat on the back of a camel, watch in hand, with an interested audience which had quickly gathered. The Arab stripped himself down to one simple robe and, barefooted, was ready to start.

The signal given, with a light leap and the help of his hands he started at one corner of the pyramid and began the ascent. Half way up I was sure he would not make it and that I would save my money, but apparently—perhaps from some optical delusion on the part of the observer—he seemed to do better the last part of the ascent, and at five and three-quarters minutes he waved both arms on the summit. This allowed only two and one-quarter minutes for the descent, and here again the first half seemed to take longer than the last half. Nevertheless he arrived at the starting point with a few seconds to spare. Not having a stop watch, there is a possible error of a few seconds both ways, but the whole was done within the time limit.

I at once slipped off the camel to count his pulse and respiration. The pulse was 144, with a very regular and strong heart action. The respiration was 36. To show that he was not fagged, although sweating profusely, he picked me, who weigh 165, right off the ground with his right arm. There was no fat on him, but his muscles were hard as iron. He claimed to be able to do this feat twice a day and does nothing else for a living. If he has enough customers with curiosity as great as mine he can, after Egyptian standards, make a very good living.

Monkeys are familiar to all visitors to zoological gardens and are always of interest. One seldom, however, sees the mother monkey with her young baby. I once saw in India the mother monkey running along the highway and then climbing a tree with the little one grasping its mother's abdomen with all four paws, which is the usual way of carrying the young. In the zoological garden at Cairo I was fortunate enough to come upon the mother monkey suckling her child at the breast. She was holding the baby, who could not have been more than a few weeks old at the most, to the breast in the same posture and with the same sort of loving expression which the human mother gives her child. She was in the sitting posture, the same which the Oriental still uses by preference, and had one arm thrown around the baby.

When the feeding was finished she took the nipple of each breast, much longer than in the human, put it in her own mouth and appeared to wash it off. As I arrived toward the end of the feeding I cannot say as to the fullness of the breasts with milk, but they appeared less developed and flabby as compared with the human.

Of course such a picture of the feeding of the infant baby monkey proves nothing, but had Mr. Bryan, with his intense opposition to the theory of evolution, been present he would have had to admit that there was some justification for the theory of the scientist that in the evolution of the ages there might have been a time when man and the ape had a common ancestor.

On telling of this incident to Dr. George Carroll Smith of Boston, at that time a guest at Shepheard's Hotel, he made a special trip out to the garden to see the unusual sight.

Travelers report on a country or on a trip in accordance with the weather and season in which they visit the same and so sometimes give very erroneous impressions. Passing through the Suez Canal and Red Sea and Indian Ocean in August of 1922, with a following wind all the way and an average temperature of around 90 to 100, I had reported it as one of the most disagreeable trips imaginable—ten days of "durance vile." The same trip taken now in December is, in weather not unlike our New England June and with a breeze in the right direction, a delightful experience for all those who love the sea.

Health and quarantine regulations are always interesting to the physician. In Egypt they are for travelers exceedingly simple and consist of paying 15 Egyptian piastres per person arriving at Alexandria and 20 piastres per person on leaving at Port Said, without so much as a pretence of having a health officer present. At Port Said one is given a quarantine certificate on departure, but none is given at Alexandria. The Egyptian piastre is worth five cents. As no one ever asks to see this quarantine certificate it looks like a bit of petty graft.

From Port Said to Colombo in Ceylon is eleven days. There are no landing formalities, and the courteous young British officer at the customs pier, after reading my baggage declaration and after my assurance that we had neither firearms nor tobacco in our luggage, did not even require it to be opened. The customs examination on entering Egypt at Alexandria is much more rigid and rather time-consuming. This is due to the fact that there is considerable smuggling from Mediterranean ports.

"What though the spicy breezes blow soft o'er Ceylon's isle,
And every prospect pleases, and only man is vile."

So runs the old missionary hymn of Bishop Heber. The people of Ceylon resent this stanza of the hymn and say the good bishop was never in Ceylon. He is certainly right as to the "every prospect pleases," but quite wrong as to the termination of the line, "and only man is vile," for a more kindly people do not exist on the face of the earth.

This is the winter season in Ceylon and the time of the northeast monsoon. The sun is very hot at midday and the European must wear a pith hat and protect the back of his neck from sun from 10 to 4. From 4 to 5 in the afternoon there is liable to come up very suddenly a heavy wind and a downpour of rain. The first afternoon we were there the storm was so violent that an Orient Line steamer broke her cable mooring and dragged her anchor toward the breakwater until rescued by tugs. The captain was fined 100 rupees by the harbor master on the ground that his cable mooring ropes were too slack and he had failed to remedy this after the pilot had called his attention to the circumstance.

Ceylon's principal products are those of the cocoanut tree, rice, rubber and tea. Rice and the cocoanut grow in the lowlands, gradually disappearing and at about two thousand feet being overlapped by rubber, which is now in the doldrums from a commercial standpoint and at another thousand feet or so disappearing, leaving tea in sole possession. This continues to thrive better and better as the altitude rises and at from six to seven thousand feet in altitude is at its best.

For be it known Ceylon is not a flat tropic isle, as often imagined, but has high mountains in its interior, a swift river, and mountain scenery and

mountain railroads the equal of any in Europe, except that there is no snow on the summits, which adds much to the picturesqueness of mountain scenery.

The mountain railway line which runs from Nanu Oya, where the main line is left, to Nuwara Eliya, is said to be the steepest gravity railroad ever built. Its grade averages one foot in each 30 to 40 and in one place has an ascent of one foot in each ten, while the hairpin turns are numerous and sharp. The entire train load must not exceed 36 tons, and before the train starts the conductor estimates the probable load, averaging the passengers at 150 pounds each for the men and 125 for the women, and the baggage car contents accordingly. The individual cars carry 12 passengers and the freight cars five tons each. The scenery of the line is that of the wild jungle interspersed with tea estates and frequent mountain streams.

Unfortunately most American travelers to Ceylon and on round-the-world trips go ashore and shop a day in Colombo or else take a hurried trip to Kandy and never see the higher mountain region. Kandy is the well advertised hill metropolis of Ceylon, 75 miles from Colombo and with good rail and automobile connection. Here are the Peradenyia botanic gardens, now a century old and containing specimens of all the trees which it is possible to grow and keep alive in this climate. One is surprised at the many varieties of palm and at the variety of its fruits and products of leaf and trunk. The forest trees are very straight and tall and very large. Many of them have trunks 50 to 75 feet straight up before a single branch, while the blossoms are of varied and brilliant color. The papaya palm gives us the substitute for the breakfast melon, while the jack fruit and the bread fruit and the custard apple are liked by some. There are, of course, many varieties of the banana.

Kandy has a good hotel and we have just celebrated Christmas here. It was a mixture of Fourth of July and Christmas together since the Christmas carolers were preceded by the explosion of giant crackers and the first part of "the night before" was as noisy as the night before the Fourth at home. And Santa Claus, instead of coming down the chimney and traveling by reindeer sled as in New England, comes dressed much the same way but travels on the back of an elephant.

Colombo has a medical school and an excellent hospital; the doctors of Ceylon have for the most part been educated in London and Edinburgh and rank high in ability. They are almost entirely Singhalese, there being but few European doctors in the island. I visited the local government hospital in Kandy. It is built on the side of a hill in an amphitheater-like arrangement of pavilion type wards, each with a grass plot between and rising terrace-like, one above another. The ward roofs are high, with wide verandas and large space between the roof overhang and the side walls. The floors are of cement and there is a cement drainage ditch around all buildings and connecting with each other, so that flushing of all floors and complete drainage can be accomplished when desired. The latrines are of the Turkish squat type, with pails which are emptied from the rear, and were clean and free from odor and flies, as were the wards also free from flies. The beds are of wood, without springs, and some have mattresses and some not. Orientals would just as soon sleep on the floor as on the bed, and on going through the hospital I saw a number on the floor by preference. Dysentery patients, of which there were several, are put on beds which have a hole through the wooden floor of the bed and under this hole a pail for the discharges. This certainly obviates any delay when the call of nature comes and solves the bed pan problem, always one in American hospitals, where patients often complain of delay when the pan is wanted. Whether it is very sanitary or desirable to adopt is another question.

The hospital was badly equipped as to facilities for sterilization as no gas is available in the city, and as no central heating is required and the doors are never closed, there is no central heating plant. This results in the use of pressure kerosene stoves, the so-called primus stove, which has many disadvantages. As a result their sterilizers and their autoclave were pitifully small. A good electric heating plant for all these is promised, but to the superintendent's disappointment has not yet materialized. There is no X-ray equipment, and the amount of surgery is, considering the size of the hospital (275 beds), relatively small. The operating room itself was not so bad, the surgical results said to be good. Where one can live practically out of doors all the time the surgical results are certainly favored. There are no industrial accidents but frequent cases of goring by bulls, the bull being the principal animal of locomotion.

The children in the hospital seemed very ill-iourished, in great distinction to the children in the streets, who are invariably well nourished, smiling and apparently as happy as children anywhere. The problem of milk supply is a serious one as to quantity, quality and cost. The Roman Catholic monastery in a village near Kandy is doing something toward remedying this at the same time that they are conducting a college and theological school. The Father in charge of agriculture showed me his herd of fine cattle, of three types: native, Australian and English. The native cows are very docile but small. The monastery is breeding fine calves from an Australian bull and so improving the cattle of the neighborhood and consequently the milk supply. They are fed on guinea grass, which grows abundantly on the monastery estate of 200 acres. This is constructive religious work, whereas the Buddhists, who are the most numerous religious body in Ceylon, do nothing of this sort for their people, though they are introducing something akin to the Y. M. C. A., calling it Y. M. B. A., the "B" standing for Buddhist.

The production of tea is one of the interesting things here in Ceylon and at present its largest and most profitable industry. The higher up on the mountains the tea grows the better the quality, and it is said—though I do not vouch for this—that an expert tea taster can tell within a couple of thousand feet or so the altitude at which the leaf was grown.

Jungle land is bought of the government, usually hillside land containing trees and underbrush. All is cut down, the good wood saved and all the rest burned, and then the roots are dug out and the whole ditched to save injury from the rains. The young plants come from nurseries. In a few years the leaves can begin to be plucked and after full bearing the leaves are picked every 10 to 13 days the year around. After three or four years of intensive picking the bush is cut down to the main stalk and the bush starts again. In time this gives a deeply rooted, very strong main stalk. Only the terminal leaf buds are picked, and only three of these, known respectively as the tip or No. 1 leaf and Nos. 2 and 3. The No. 1 leaf brings the largest price when kept separate. On a large plantation or estate the picking is constant. It is done by Tamil women from India, who earn about 35 cents a day. These people live in colonies on the tea estates, in little sheds divided into very small tenements with a single door and no window. Beds are unnecessary, as the common custom is to sleep on a mat on the floor. Clothing is a negligible item in the cost of living, rice for food being the principal expense. The women have a passion for jewelry, both gold and silver, and carry it in their ears, in their noses, around their necks and on their ankles and toes. Schools for the children are conducted on all the estates and they appear a contented and happy lot. Were the American wage scale in effect tea would have to bring much higher prices.

The tea leaves, once plucked, must be carefully wilted on shallow canvas frames and then the day following rolled in a special machine and then dried

with hot air, graded and sorted. Buildings for this are a part of every tea estate.

When the readers of the JOURNAL take their winter vacation or make a trip around the world may I recommend a visit to Ceylon?

GEO. L. RICHARDS.

Kandy, December 26, 1924.

DERMATITIS MEDICAMENTOSA CAUSED BY BENZYL BENZOATE

Editor, BOSTON MEDICAL AND SURGICAL JOURNAL:

The clinical use and value of Benzyl Benzoate is still in the experimental stage, and a perusal of the literature failed to revealed a similar case to the one cited below. Through the courtesy of the American Medical Association, I was supplied with a description of this product.

Benzyl Benzoate—C_6 H_5 COO. CH_2 C_6 H_5 is the benzyl alcohol ester of benzoic acid. It contains not less than 95 per cent benzyl benzoate. Benzyl benzoate is a colorless oily liquid above about 20 C. It is odorless or has a faint aromatic odor, and a sharp burning taste. It is insoluble in water or glycerin but miscible in all proportions with alcohol, chloroform or ether. It boils at from 320 to 325 C with partial decomposition. When ignited it burns with a very smoky flame. Specific gravity 1.09 to 1.13 at 15 C., 1.083 to 1.22 at 25 C. It is neutral to litmus. It is readily saponified by alcoholic solution of potassium hydroxide.

Benzyl Benzoate lowers the tone of unstripped muscle, and has been suggested as a remedy against renal, biliary, uterine and intestinal colic and other spasms of smooth muscle, including angiospasm. Its dosage is 5 to 7 minims.

Benzyl benzoate is relatively non-toxic, but its clinical value is doubtful, for enquiry elicited the information that its ability to lower hypertension was nil. It has proved useful in a certain number of cases of dysmenorrhoea, angina pectoris, and intestinal colic.

Such being the case I deem it wise to draw attention to a severe generalised skin eruption which has recently come under my notice.

Mr. J. K. age 34; single; white; engineer; private patient referred through courtesy of Dr. John Fennessey. This patient had a severe cold towards the latter part of August, 1924. Failing to obtain relief he took bromo-quinine, also without result. He then took benzyl benzoate for three weeks in September. The eruption appeared early in October. His blood Wassermann was negative. The eruption was generalised, only sparing the face and scalp. It was a discrete, flat-topped, shiny papulide, moderately itchy and reddish in colour. It in no way resembled a rash one would expect from bromo-quinine. It was quite unusual in appearance, and unlike any of the commoner or rarer skin diseases. The diagnosis was made by rigid exclusion.

Diagnosis—Dermatitis Medicamentosa.

Cause—Benzyl Benzoate.

W. J. MACDONALD, M. D.

270 Commonwealth Ave., Boston, Mass.

A LETTER SENT TO THE SECRETARIES OF THE DISTRICT SOCIETIES BY THE COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS

January 21, 1925.

Dear Doctor:

The Recess Committee of the Massachusetts Legislature have reported on the matters (Public Health) referred to them from the 1924 session. This report is Senate Bill No. 19 and contains two or three supplemental bills for enactment at this (1925) session of the General Court. The purpose of these bills is to make effective the subjects considered in the report of the Recess Committee. If these bills are passed, and, in the opinion of the Committee of Medical Education of the Massachusetts Medical Society, they ought to pass, the present medical registration law will be modified in the following ways:

First—There will be a new Board of Registration having control over all professional registrations in the State, composed of seven men, no two of whom shall represent any one profession. They will establish the standards to be set up and govern the policies laid down. Under them, in medicine, will still be the Board of Examiners for Medicine, who will set the examinations in the subjects prescribed by the Board of Registration.

Second—The Board of Examiners shall be appointed by the Governor as now, one each June for seven years, and in the same way as now in all respects, except that there need no longer be any attention paid to the proportional membership from the chartered State societies.

Third—The Board of Examiners may refuse to admit to their examinations candidates from schools not acceptable to the Board.

Fourth—Provision is made to secure the necessary funds to employ experts to investigate any or all schools to determine their standing, from time to time.

It will readily be seen that, if enacted, practically all the defects of our present medical practice law will be removed or circumvented. Nos. 2 and 3 were the matters which the Massachusetts Medical Society, through its Committee on Medical Education, sought to have the 1924 Legislature incorporate in the law. No. 1 creates a supervisory Board having the powers of the New York regents and gives them control over the policy of the State in regard to those qualified to practise the healing art within its borders.

Please bring this matter to the attention of your Society at the earliest possible moment, for the report will soon come up for consideration and influence must promptly be brought to bear upon the members of the General Court through the medical profession. It is suggested that in your district as many men as may, approach the Senator or Representatives from the district and impress upon them the importance of this legislation for the public welfare. This act is proposed by members of the Legislature itself and is not open to the oft expressed objection that it is fathered by the "Medical Trust" or the American Medical Association.

Please give this your immediate attention and notify this committee (Committee on Medical Education and Diplomas) of the Massachusetts Medical Society, through its Chairman at the address given below, of what steps you have taken and what members of the General Court have been approached.

Sincerely yours,

C. F. PAINTER,
Chairman.

520 Commonwealth Avenue, Boston, Mass.

REPORTS AND NOTICES OF MEETINGS

The Massachusetts Medical Society

THE COUNCIL MEETING FEBRUARY 4th, 1925

THE meeting was called to order by President Bigelow who addressed the Council as follows:

THE welfare of the Massachusetts Medical Society depends upon the prosperity of the District Societies.

Any harm coming to one of our eighteen District Societies hurts its parent Society whose children they are.

Our Commonwealth is jealous for the well being of the cities and towns created by the State. In like manner, the Massachusetts Medical Society has a vital interest in everything affecting the Districts from the Berkshires to the Cape.

I find increased interest in the District meetings throughout the State. Combined meetings, hospital meetings, meetings at our state institutions appeal to the busy doctor as worth while.

I am impressed by the character and ability of the officers of local societies. Many of these have served for years with unfailing devotion to duty.

If the Massachusetts Medical Society counts for anything in the life of the State, it is due, in large part, to these men.

You have read in the JOURNAL the report of the Committee on Society Headquarters. The Massachusetts Medical Society has now, subject to the approval of the Council, a committee room where our members may meet and where our committees may do their work more efficiently. The latch string is out at 126 Massachusetts Avenue, Room 408.

The ex-airman, whose case I brought to the attention of the Council in October, has been reinstated. He is at Saranac under the care of Dr. Brown. Let us see to it that no worthy invalid soldier suffers neglect through lack of interest on our part.

Our Committee on Uniform Health Examinations reported to the Council in October. This report has met with the approval of our members. What is the next step in this matter?

Should not the Society give to its members an opportunity to see the plans of the Committee in use? That is, should we not demonstrate at District meetings health examinations made by our fellows who have had first hand experience in this work? These examinations, sufficiently simple to be used in the private office, and yet sufficiently exhaustive to show whether further diagnostic study is necessary, might be made on the fellows themselves.

General health examinations can never be a complete diagnostic examination but should go far enough into each of the systems of the body to tell whether they are functioning properly or whether they need further time consuming and elaborate study to recognize disease or assure normal health.

I would suggest that we select a group of our members, familiar with this work, to go to our Districts to demonstrate their methods, travel expenses to be met by the Society. Thus, may this admirable report of the Committee bear fruit, the growing demand of the public be met, and the cause of sound individualized preventive medicine be advanced.

With the splendid personnel of our Society and with the trust and support given our members by the citizens of the state, let us render a larger service in return.

Some of the especial points of interest are presented in advance of the Official Proceedings which will appear soon. The report of the Committee on Arrangements for the Annual Meeting was adopted. This carries with it the approval of the recommendation for a charge of two dollars per plate for those who attend the annual dinner which will probably be in the Copley-Plaza because there are not sufficient accommodations in the John Hancock Building where the scientific sessions will be held. It is planned to have the dinner in the evening. After the Shattuck Lecture some entertainment is to be provided. The tentative suggestion is for moving pictures.

The Committee on Medical Education and Medical Diplomas reported that efforts made to secure permission for an inspection of the local medical schools had not resulted in coöperation and that those members of the Society who were connected with the faculty of the Middlesex College had resigned from the Massachusetts Medical Society. The College of Physicians and Surgeons notified the Committee that no permission would be granted for an inspection.

Dr. Burnham of Lawrence referred to the report of the delegates to the House of Delegates of the A. M. A. submitted to the Council last October relating to the report of the Judicial Council, in which the plan to provide physical examinations by commercial organizations was not approved. The whole matter has been presented in the report of the minutes of the House of Delegates, pages 22 to 24. The report of the delegates from the Massachusetts Medical Society appeared in the BOSTON MEDICAL AND SURGICAL JOURNAL, October 23, 1924.

He offered a resolution to the effect that this matter be referred to the Standing Committee on Public Instruction for consideration. Dr. Mongan felt that the subject is serious and merits careful attention. He seconded the resolution of Dr. Burnham, which was accepted.

The recommendation of the Committee appointed to consider accommodations for the Society, for hiring Room 408 adjoining the editorial rooms of the JOURNAL, was accepted. The further recommendation for the appointment of a permanent committee was not taken up

and will probably be considered at a further meeting.

The Treasurer's report showed a satisfactory condition of the finances and no change was made of the annual dues or the remissions to the District Societies.

The recommendations relating to membership and finance presented by the Committee were approved without discussion.

There was a large attendance.

The official proceedings will be published at an early date when put in form by the Secretary. Every member of the Society should read the official publication.

MEETING OF THE HARVARD MEDICAL SOCIETY

THE Harvard Medical Society met at the Peter Bent Brigham Hospital on Tuesday evening, Jan. 27th.

Three cases were demonstrated, one of intracranial aneurysm and two of pernicious anaemia.

Dr. Gibbs Milliken presented the results of some research conducted by himself and Dr. L. R. Whittaker on the administration of tetraiodo phenolphthalein for purposes of gall-bladder radiography. They have been successful in obtaining satisfactory shadows of the bladder after giving this substance by mouth. One-tenth of a gram per kilogram of body weight is administered in salol coated pills. In most cases no disagreeable symptoms follow and the method has great advantages over intravenous injection, being both simple and practical. The iodine compound gives better results than the bromine compound.

In the absence of Dr. C. L. Brown, his paper on acute serous encephalitis was presented by Dr. Wolbach. This is a newly recognized disease of childhood. Dr. Brown, in collaboration with Dr. Simmons of New York, has done extensive work on the symptomatology and pathology of the disease. The onset is marked by irritability, vomiting, diarrhoea, sore throat and other symptoms referable to the brain. The illness is of only a few days' duration, winding up with coma, convulsions and death. Autopsies show marked oedema of the brain with evidence of a cellular reaction in the basal ganglia. There is extreme enlargement of the brain with flattening of the convolutions and congestion in the arachnoid. The cellular reaction and pathology are very different from other types of encephalitis. Attempts to inoculate animals and to grow organisms from the lesion have so far been unsuccessful. All the observed cases of the disease have occurred in the summer months. The average age in these cases was twenty-eight months.

Dr. Henry A. Christian spoke on pernicious anaemia and related diseases. Certain symptoms are more or less common to these pathological conditions. In the following summary he gave these symptms in order of their occurrence in each particular disease.

Pernicious Anaemia—Gastric anacidity, periodic sore tongue, C. N. S. sclerosis, blood changes, gastro-intestinal symptoms.

Secondary Anaemia—Blood changes, gastro-intestinal symptoms.

Sprue—Periodic sore tongue, gastro-intestinal symptoms. Blood changes, gastric anacidity (not an early symptom), C. N. S. sclerosis.

Sub-Acute Combined Sclerosis—Gastric anacidity, blood changes.

Multiple Sclerosis—Normal gastric acidity, no or slight blood changes.

Polycythemia—Blood changes (poly changes), sore tongue, gastric anacidity, blood changes (anaemic).

Pellagra—Periodic sore tongue, gastro-intestinal symptoms, mental symptoms.

In four to six per cent. of the entire population there is total absence of free hydrochloric acid in the stomach. It would seem that this condition is inherited in many instances. About sixteen per cent. of those with gastric anacidity develop pernicious anaemia. Gastric anacidity sometimes occurs after gastrectomy. After a few years the anacidity is often followed by pernicious anaemia.

Monilia psilosis has been rather generally accepted as the cause of sprue and some authorities hold the view that pernicious anaemia has an identical etiology. Others are of the opinion that achlorhydria is the main factor. The latter may also be a cause of sub-acute combined sclerosis. The frequency of achlorhydria in these conditions is rather convincing as shown by the following percentages.

Normal—4%.
Various diseases—14.8%.
Pernicious Anaemia—96%.
Sub-Acute Combined Sclerosis—100%.
Tabes—11%.

Climatic conditions may explain the prevalence of pernicious anaemia in New England as compared with the Philippines. Sprue is more common in the Philippines, whereas both types of disease are common in North Carolina, an intermediate zone.

Observations made in Manila have given birth to the idea that a photo sensitive substance is produced by organisms in the body, making the red cells more susceptible to the effects of sunlight. If sprue and pernicious anaemia were identical, this theory would indicate a more rapid course of the disease in the Tropics. On the contrary the disease progresses less rapidly in the Tropics than in this climate. Discussion followed Dr. Christian's remarks.

BOSTON MEDICAL HISTORY CLUB

MINUTES OF THE MEETING, JANUARY 19, 1925

DR. HARVEY CUSHING spoke of the Medical History Club at the Johns Hopkins Hospital,

originally founded by Osler and Welsh. Regular meetings have not been held for the last few years. Interest, however, has been renewed recently and a meeting is being held tonight in memory of Osler. He suggested that the Boston Medical History Club should send greetings to them. The following telegram was therefore sent:

"Dr. F. S. Fletcher,
Johns Hopkins Hospital,
Baltimore, Maryland.

On the occasion of the Osler Memorial Meeting tonight, the Boston Medical History Club sends cordial greetings.

H. R. VIETS, *Sec.*"

Dr. George Sarton then spoke of the "Growth of Understanding vs. The Progress of Science." He mentioned the difficulties that people in general had in the middle ages in learning about an important discovery. Now, the whole world knows almost at once about a discovery like wireless telegraphy. In addition, to study ancient history, it is not only necessary to know what a man like Galen knew, but also how that knowledge has come down to us. Very few historians have given much thought to the history of the middle ages. It is necessary to study medieval history in order to get the connecting link between ancient and modern science. A knowledge of Latin and Arabic is absolutely essential to the student of medieval thought. From the eighth to the eleventh century everything of importance to the historian of science was written in Arabic.

Dr. Sarton then discoursed on the early history of numbers, noting that in any system of numerals it is necessary to have, (1st) numerical symbols; (2nd) a zero; and (3rd) a basis of counting by ten, or some other factor. The early symbols are Babylonian; their basis for accounting, however, was 60 instead of 10. Modern numbers came from India about the fifth century along with Hindu mathematics and astronomy. They were introduced by the Arabs and therefore called Arabic numerals today. Though this system was used by the Arabs at least from the ninth century, it was not definitely in vogue until the latter part of the twelfth century. Roman numbers which are much more complicated were used when writing the results, only. They could not be conveniently used for computation. Yet there was much opposition to the use of the Arabic numerals, and in 1299 the bankers of Florence forbade their use. The next step was the development of decimal fractions, although fractions had been used for many centuries, and the Babylonians used the fraction "1/60" which we use today for computation of time and to divide the arc of a circle.

Although the decimal system was discovered primarily by one man, there are elements in it which were discovered by many. This man was Simon Stevin (Stevinus), one of the greatest men in the sixteenth century. He was born in Bruges in 1548 and died in 1620. There is a statue of him in Bruges. He was a bookkeeper and later went to Antwerp. He was called by Prince Maurice of Orange to be the quartermaster general of his armies and technical adviser. He is noted as the founder of modern statics and hydrostatics. His books, which delight book collectors, were written in Dutch, which he considered fitted for a universal language, but translated into Latin, French, and English. In 1585 he published his famous pamphlet on "De Thiende (The Tithe)," in Dutch. A French edition soon followed. In this paper he described decimal fractions though not in their modern form. Besides the decimal numbers, he also proposed the metric system of weight and measures, also based on the factor of ten. This idea, although completely expounded by Stevin, was not actually realized until very much later. Watt, the discoverer of the steam engine, proposed the same idea, as did Christopher Wren, the great architect. The real transformation, however, came at the time of the French revolution, when the meter was made the standard of measurement. The main points of this system, however, were clearly demonstrated by Stevin in 1585.

Dr. Sarton would feel that the very complicated system of measuring and weighing used today throughout the Anglo-Saxon world is very unsatisfactory. It is unnecessary to burden ourselves with so much useless knowledge, as our time to acquire knowledge is relatively limited. The growth of understanding, however, is slow, often lagging far behind the progress of science as exemplified by the work of Stevin.

Dr. E. C. Streeter spoke on the "Discovery of Valves in the Veins by Canano." He emphasized the points made by Dr. Sarton in regard to the acquisition of knowledge as exemplified by his own paper. He noted that the valves in the veins had been twice discovered and twice lost, and the value of this discovery was not utilized until nearly 100 years later by Harvey, in 1628. Harvey, however, said erroneously that the valves were discovered by Fabricius of Aquapendente (1537-1619). Fabricius had written a book on them stating very definitely that he was the first to see and describe the valves. The valves were one of the three points necessary to establish Harvey's demonstration of the circulation of the blood. Riolan, who disputed Harvey's discovery in Paris, thought that his teacher, Sylvius, was the discoverer.

Fabricius, however, was completely ignorant of the real discoverer, although Fallopius, who sat in the chair at Padua before him, knew that Canano was the discoverer. Fabricius first made his claim to discovery in 1574. He apparently made the discovery viable, but should not

be credited with it. The claim for Sylvius is based upon a fictitious 1532 Venetian edition of his "Isogoge." The valves, however, are mentioned in a 1555 Paris edition of the work of Sylvius. Another claimant is Charles Estienne (Stephanus) who described valves in the portal system of the lower animals. Although his book was published in 1545, it was undoubtedly written six years earlier. Neither of these claims, however, can be upheld.

The real discoverer of the valves was a Greek, who had had an exceptional training in anatomy at Ferrara, Gianbatista Canano, by name. He started to write a complete anatomy in five volumes, publishing the first and only volume about 1540, a few years before the "Fabrica" of Vesalius (1543). Vesalius came to Ferrara (?1541) and apparently Canano, seeing that the work of Vesalius was so much finer than his, withdrew his work after the first volume had been published, a splendid and outstanding example of chivalry in medicine.

Canano was not only a great anatomist but a great discoverer. In the midst of his work he discovered the valves in the veins. Vesalius says, in reporting a consultation he had with Canano at Ratisbon in 1546, that Canano had seen the valves in the veins some years before. Vesalius did not seem to be very much interested. In the second edition of the "Fabrica", in 1555, he mentions the valves of the veins, but does not lay special stress upon them. This was published the same year as the book of Sylvius. There took place during this period a controversy in regard to the bleeding on the right side or the left in cases of pleurisy (Pierre Brissot, 1478-1522). The arguments depended partly upon the finding of a valve in the azagos vein at the orifice, although it was shown later that such is not the case in man. The controversy was so violent that it pushed aside Canano's discovery so that it was forgotten. In the meantime Fabricius in 1603 made his announcement of the discovery which was accepted and served to more completely obscure the work of Canano.

There is evidence that Erisistratus may have known something about the valves in the veins. He certainly had complete knowledge of the valves of the heart.

Dr. Streeter then showed a number of books illustrating his paper.

Dr. Cushing said that the evening ought not to pass without a word of appreciation for the splendid papers presented by Dr. Sarton and Dr. Streeter. They were so complete that they needed little comment.

Dr. Sarton brought out in the discussions that there were two main reasons why the metric system was not adopted and other changes made, such as the scale of the thermometer. First, the mental inertia which was characteristic of the peoples in general, and second, the apparent desire to not be too systematic.

VACCINATION BILLS

THE bills on vaccination will be heard February 17. Every physician who can find time should come and be recorded in favor of Dr. S. B. Woodward's bill.

A PHYSIOLOGICAL CONFERENCE will be held Wednesday, February 18, in the Bowditch Library, Building C of the Harvard Medical School, at 4 P. M. Miss Abby H. Turner will speak on "Circulatory Efficiency."

SOCIETY MEETINGS

Essex North District Medical Society

May 6, 1925. Annual meeting at Lawrence.

Franklin District Medical Society

The meetings of the Franklin District Medical Society will be held on the second Tuesday of March and May.

Hampden District Medical Society

Meeting to be held on the third Tuesday in April.

Hampshire District Medical Society

The meetings will be held the second Wednesday of March and May.

Middlesex East District Medical Society

Wednesday, March 18. Harvard Club. Dr. John H. Cunningham, "Urinary Retention: Its Significance and Treatment."
Wednesday, April 15. Harvard Club.
Wednesday, May 13. Colonial Inn, North Reading.

Middlesex North District Medical Society

April 29, 1925.

Middlesex South District Medical Society

Winter Schedule—The plans for winter meetings of the Society include the stated meeting in April, two hospital meetings, and five meetings to be held in conjunction with the Suffolk District Medical Society and the Boston Medical Library (two surgical, two medical, and one general).

Norfolk District Medical Society

February 24, 1925. Masonic Temple. Subject: "The Need of Periodical Physical Examinations and How to Make Them." Speaker: Dr. Francis H. McCrudden. A second speaker will be selected to present another subject at this meeting.
March 31, 1925. Tufts College Medical School. This meeting given over to Drs. Leary and Watters for the purpose of giving us a medical examiners' talk.

Norfolk South District Medical Society

Meetings will be held the first Thursday of each month to May, inclusive, at 12 noon, at the Norfolk County Hospital, South Braintree.

Suffolk District Medical Society

February 25. Surgical Section, in association with the Middlesex South District Medical Society. "Pyelonephritis," Dr. Arthur H. Crosbie.
March 25. Medical Section, in association with the Middlesex South District Medical Society. "The Treatment of Pneumonia," Dr. Edwin A. Locke.
April 29. Annual meeting. "Hypertension and Longevity," Dr. Harold M. Frost.

Worcester District Medical Society

March 11, 1925. St. Vincent's Hospital, Worcester. Papers will be read by the members of the hospital staff.
April 9, 1925. Subject and speaker to be announced.
May 14, 1925. Annual meeting.

If you desire further information in regard to these meetings write to the Secretaries of the District Medical Societies (listed on page xv of the Advertising Section). The Massachusetts Medical Society Directory contains their addresses.

BOOK REVIEWS

Abt's Pediatrics (Volumes IV and V). By 150 specialists. Edited by ISAAC A. ABT, M.D., Professor of Diseases of Children, Northwestern University Medical School, Chicago. Set complete in eight volumes, totalling 8000 pages, with 1500 illustrations. Philadelphia and London: W. B. Saunders Company. 1924. Cloth, $10.00 per volume. Sold by subscription.

The two latest volumes of Abt's Pediatrics to appear maintain the high level and encyclopedic char-

acter set by the preceding volumes. Volume IV is devoted largely to the contents of the thorax, circulatory and blood diseases, endocrinology and the genito-urinary organs and their disorders, among the authors being such authorities as Kenneth D. Blackfan, Jessie R. Gerstley, Clifford G. Grulee, Henry F. Helmholz and William Palmer Lucas.

Volume V is given over in large part to a section on orthopedic surgery, edited by Arthur Steindler. The subject is in general well handled, a chapter of unusual practical importance being devoted to the care and treatment of healthy and painful feet, with especial emphasis laid on proper and improper types of shoes.

Tuberculosis and syphilis are discussed in this volume, and a large group of infectious diseases, such as plague, actinomycosis, glandular fever, dengue, the trypanosonicoses, Malta fever, kala-agar, yellow fever and malaria. The volume closes with a chapter on infection and immunity by James P. Simonds, M.D., professor of pathology at Northwestern University Medical School.

The more volumes of this work that are reviewed the more is one impressed with the infinite care that has been taken to leave no important or unimportant subject in pediatrics uncovered.

BOSTON MEDICAL LIBRARY

RECENT ACCESSIONS

Arey, L. B. Developmental anatomy. Phila. Saunders, 1924.

Armstrong, E. F. The carbohydrates and the glucosides. 4 ed. Lond. 1924.

Aschoff, L. Lectures on pathology. N. Y. Hoeber, 1924.

Bandler, S. W. Medical gynecology. 4 ed. Phila. Saunders, 1924.

Bayliss, Sir W. M. Principles of general physiology. 4 ed. Lond. Longmans, 1924.

Bertwistle, A. P. A descriptive atlas of radiographs of the bones and joints. N. Y. Wood, 1924.

Bickham, W. S. Operative surgery, vols. 5-6 and General index to vols. 1-6. Phila. Saunders, [c1924].

Boyd, W. Surgical pathology. Phila. Saunders, [c1925].

Cohn, I. Normal bones and joints Roentgenologically considered. N. Y. Hoeber, 1924.

Diseases of women, by ten teachers, under the direction of Comyns Berkeley. 3 ed. Lond. Arnold, 1924.

Draper, G. Human constitution: a consideration of its relationship to disease. Phila. Saunders, 1924.

DuBois, E. F. Basal metabolism in health and disease. Phila. Lea, 1924.

Findlay, A. Physical chemistry for students of medicine. Lond. Longmans, 1924.

Guild of Saint Apollonia. A brief historical sketch. Edited by Frederick A. Keyes. Boston Pilot Publ. co. [1924.]

Haskins, C. H. Studies in the history of mediæval science. Camb. Univ. pr. 1924.

Helmholtz, H. L. F. Helmholtz's treatise on physiological optics. Translated from the third German edition. Edited by James P. C. Southall. v. 1. Menasha, Optical soc. of America, 1924.

Höjer, J. A. Studies in scurvy. Uppsala, Almqvist, 1924.

Howard, W. T. Public health administration and the natural history of disease in Baltimore, Maryland, 1797-1920. 4°. Wash. 1924.

Janet, P. Principles of psychotherapy. Translated by H. M. and E. R. Guthrie. N. Y. Macmillan, 1924.

Kerley, C. G. & Graves, G. W. The practice of pediatrics. 3 ed. Phila. Saunders, [c1924].

Mellor, J. W. A comprehensive treatise on inorganic and theoretical chemistry. v. 5. Lond. Longmans, 1924.

Muhl, G. Uber den Stoffwechsel des gesunden, natürlich ernährten Säuglings und dessen Beeinflussung durch Fettreduktion der Nahrung. Uppsala, Almqvist, 1924.

Packard, F. R. Guy Patin and the medical profession in Paris in the XVIIth century, N. Y. Hoeber, 1925.

Parson, B. S. Lefthandedness, a new interpretation. N. Y. Macmillan, 1924.

Pasteur, L. Œuvres de . . . v. 3. Etudes sur le vinaigre et sur le vin. Par. Masson, 1924.

Pearson, K. The life, letters and labours of Francis Galton. v. 2. Camb. Univ. pr. 1924.

Pediatrics by various authors. Edited by Isaac A. Abt. v. 4-5. Phila. Saunders, [c1924].

Roaf, H. E. A text-book of physiology. N. Y. Longmans, 1924.

Rockefeller foundation. Division of medical education. Methods and problems of medical education. 1st and 2nd series. 4°. N. Y. 1924.

Simmons, G. H. Testimonial banquet with presentation of portrait to . . . on the twenty-fifth anniversary as editor of the Journal of the American medical association, Monday, the ninth of June, nineteen hundred and twenty-four. 8°. Chic. 1924.

Stocks, P. Blood pressure in early life. A statistical study. Lond. 1924.

Vaquez, H. Diseases of the heart. Translated and edited by George F. Laidlaw. Phila. Saunders, [c1924].

Vermont. Department of public health. Infantile paralysis in Vermont, 1894-1922. A memorial to Charles S. Caverly. Burlington, 1924.

White, J. R. The clinical examination of surgical cases. N. Y. Macmillan, 1924.

White, J. R. A text-book of surgical handicraft. N. Y. Macmillan, 1924.

White, W. A. An introduction to the study of the mind. [N. Y.] 1924.

Williams, L. R. Tuberculosis; nature, treatment and prevention. 16°. N. Y. 1924.